ELEMENTARY
MATERIA MEDICA

WILLS

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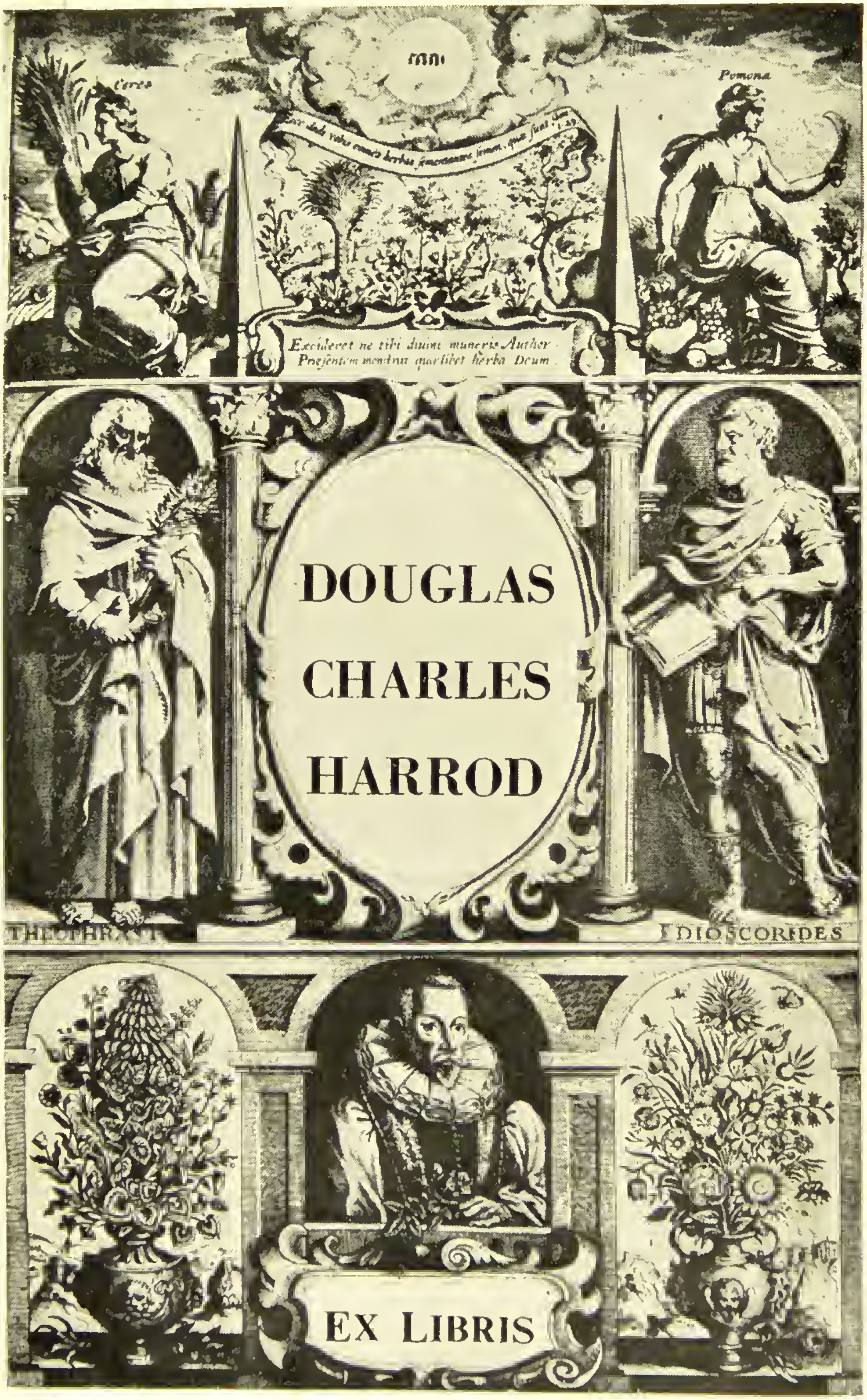
Ceres
Pomona
dedi vobis omnis herbas
Excideret ne tibi diuini muneris Author
Præſentem monſtrat quaelibet herba Deum.
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A MANUAL

OF

ELEMENTARY MATERIA MEDICA

BY

G. S. V. WILLS, F.L.S., F.R.M.S., &c.
Analytical and Consulting Chemist,
Director of the Westminster College of Chemistry and Pharmacy,
Member of the Pharmaceutical Society,
Member of the Society of Chemical Industry, &c.

TWELFTH EDITION

PRICE 5s.

London
SIMPKIN, MARSHALL, HAMILTON, KENT & CO., Ld.
HENRY KIMPTON, 82, High Holborn, W.C.
H. T. GOULD & CO., Hobart, Tasmania
And at the Office of the COLLEGE, Trinity Square, Borough,
London, S.E.
1893

Entered at Stationers' Hall.

EARLY SCIENCE COLLECTION
KS153.WIL
[illegible] 416779

PRINTERS:
BUCK AND WOOTTON, 126, WESTMINSTER BRIDGE ROAD,
LONDON, S.E.

KING'S COLLEGE LONDON

THE WESTMINSTER
College of Chemistry and Pharmacy,

TRINITY SQUARE, BOROUGH, LONDON, S.E.

Principals:—G. S. V. WILLS and H. WOOTTON.

MUSEUM DEPARTMENT.

LIST OF CHEMICALS.

This Catalogue contains the names and formulæ of the MOST IMPORTANT *chemicals n the Museum of the Westminster College, each number corresponding with that n the bottle containing the specimen.*

Each Student is required to prepare practically as many of the specimens as ossible during his course of laboratory instruction.

N.B.—For Materia Medica Specimens, Pharmacy Specimens, and Dried Botanical Specimens, see separate lists.

Potassium carbonate. K_2CO_3
Potassium bicarbonate. $KHCO_3$
Potash, caustic. KHO
Potassium acetate. $KC_2H_3O_2$
Potassium citrate. $K_3C_6H_5O_7$
Potassium tartrate. $K_2C_4H_4O_6$
Potash, sulphurated. $K_2S_3,K_2S_2O_3$
Potassium nitrate. KNO_3
Potassium acid tartrate. $KHC_4H_4O_6$
Potassium sulphate. K_2SO_4
Potassium iodide. $KI.$
Potassium bromide. $KBr.$
Potassium bichromate. $K_2Cr_2O_7$
Potassium permanganate. $KMnO_4$
Potassium chlorate. $KClO_3$
Potassium cyanide. KCN
Potassium ferrocyanide. $K_4FeC_6N_6,3H_2O$
Potassium ferricyanide. $K_6Fe_2C_{12}N_{12}$
Sodium chloride. $NaCl$
Sodium carbonate. $Na_2CO_3,10H_2O$
Soda, caustic. $NaHO$
Sodium bicarbonate. $NaHCO_3$
23 Sodium acetate. $NaC_2H_3O_2$
24 Sodium nitrate. $NaNO_3$
25 Sodium sulphate. $Na_2SO_4,10H_2O$
26 Sodium sulphite. $Na_2SO_3,7H_2O$
27 Sodium bromide. $NaBr$
28 Sodium iodide. NaI
29 Soda, tartarated. $KNaC_4H_4O_6.4H_2O$
30 Sodium phosphate. $Na_2HPO_4,12H_2O$
31 Sodium arseniate. $Na_2HAsO_4,7H_2O$
32 Sodium biborate. $Na_2B_4O_7,10H_2O$
33 Sodium hypophosphite. $NaPH_2O_2$
34 Sodium sulphocarbolate. $NaC_6H_5SO_4,2H_2O$
35 Sodium salicylate. $(NaC_7H_5O_3)_2H_2O$
36 Sodium valerianate. $NaC_5H_9O_2$
37 Sodium citro-tartrate, effervescent.
38 Ammonium chloride. NH_4Cl
39 Ammonia solution. NH_4HO
40 Ammonium carbonate. $N_3H_{11}C_2O_5$
41 Ammonium nitrate. NH_4NO_3

42 Ammonium phosphate.
$(NH_4)_2HPO_4$
43 Ammonium bromide. NH_4Br
44 Ammonium benzoate.
$NH_4C_7H_5O_2$
45 Ammonium acetate. $NH_4C_2H_3O_2$
46 Ammonium citrate.
$(NH_4)_3C_6H_5O_7$
47 Ammonium sulphate. $(NH_4)_2SO_4$
48 Ammonium oxalate. $(NH_4)_2C_2O_4$
49 Ammonium sulphydrate. NH_4HS
50 Barium nitrate. $Ba2NO_3$
51 Barium chloride. $BaCl_2,2H_2O$
52 Calcium hydrate. $Ca2HO$
53 Calcium chloride. $CaCl_2,2H_2O$
54 Calcium sulphate. $CaSO_4$
55 Calcium carbonate, prepared.
$CaCO_3$
56 Calcium carbonate, precipitated.
$CaCO_3$
57 Calcium phosphate. Ca_32PO_4
58 Calcium hypophosphite.
$Ca2PH_2O_2$
59 Lime, chlorinated. $CaCl_2O_2,CaCl_2$
60 Lime, sulphurated.
61 Magnesium oxide. MgO
62 Magnesium carbonate.
$(MgCO_3)_3Mg2HO,4H_2O$
63 Magnesium chloride. $MgCl_2$
64 Magnesium sulphate.
$MgSO_4,7H_2O$
65 Alum. $Al_23SO_4,K_2SO_4,24H_2O$
66 Aluminium sulphide. Al_2S_3
67 Alum, iron.
$Fe_23SO_4,K_2SO_4,24H_2O$
68 Alum, chrome.
$Cr_23SO_4,K_2SO_4,24H_2O$
69 Zinc oxide. ZnO
70 Zinc sulphate. $ZnSO_4,7H_2O$
71 Zinc acetate. $Zn2C_2H_3O_2$
72 Zinc carbonate.
$ZnCO_3,2Zn2HO,H_2O$
73 Zinc chloride. $ZnCl_2$
74 Zinc valerianate. $Zn2C_5H_9O_2$
75 Zinc oleate. $Zn2C_{18}H_{33}O_2$
76 Zinc sulphocarbolate.
$Zn2C_6H_5SO_4,H_2O$
77 Iron, reduced.
78 Iron arseniate. Fe_32AsO_4
79 Iron carbonate, saccharated
80 Iron phosphate. $Fe_32PO_4.8H_2O$
81 Iron sulphate. $FeSO_4,7H_2O$
82 Iron oxide, magnetic. Fe_3O_4
83 Iron peroxide, hydrated.
Fe_2O_3,H_2O
84 Iron ammonium citrate.
85 Iron and quinine citrate.
86 Iron tartarated
87 Iron perchloride. Fe_2Cl_6
88 Iron pernitrate. Fe_26NO_3
89 Iron peracetate. $Fe_26C_2H_3O_2$
90 Iron persulphate. Fe_23SO_4
91 Copper sulphate. $CuSO_4,5H_2O$
92 Copper nitrate. $Cu2NO_3.3H_2O$
93 Copper subacetate.
$Cu_2O2C_2H_3O_2$
94 Mercury subchloride. $HgCl$
95 Mercury oxide, red. HgO
95 Mercury oxide, yellow. HgO
95 Mercury oxide, black. Hg_2O
96 Mercury sulphate. Hg_2SO_4
97 Mercury sulphide. Hg_2S
98 Mercury iodide, green. HgI
99 Mercury with chalk.
$Hg+CaCO_3$
100 Mercury nitrate. $HgNO_3$
101 Mercury perchloride. $HgCl_2$
102 Mercury ammoniated.
NH_2HgCl
103 Mercury oleate. $Hg2C_{18}H_{33}O_2$
104 Mercury persulphate. $HgSO_4$
105 Mercury iodide, red. HgI_2
106 Mercury pernitrate. $Hg2NO_3$
107 Arsenious oxide. As_2O_3
108 Arseniuretted hydrogen. AsH
109 Arsenium iodide. AsI_3
110 Antimony sulphide. Sb_2S_3
111 Antimony chloride. $SbCl_3$
112 Antimony oxide. Sb_2O_3
113 Antimony tartarated.
$(KSbOC_4H_4O_6)_2H_2O$
114 Antimony sulphurated.
Sb_2S_5,Sb_2O_3
115 Lead monoxide. PbO

—OF—

CHEMISTRY + AND + PHARMACY,

LONDON.

DISTINGUISHING CHARACTERS

of the COMMON NATURAL ORDERS.

Compositæ.

Inflorescence a Capitulum. Stamens 5. Anthers syngenesious. Fruit a Cypsela.

Convolvulaceæ.

Plants twining or trailing. Corolla infundibuliform, Æstivation plaited.

Cruciferæ.

Calyx with 4 sepals. 2 gibbous at the base. Corolla cruciate, Stamens tetradynamous. Fruit a Siliqua or Silicula.

Cucurbitaceæ.

Plants succulent and climbing or trailing. Flowers unisexual, yellow or green. Corolla gamopetalous. Ovary inferior. Fruit a Pepo or Berry.

Labiatæ.

Stem square. Leaves opposite, and decussate, Flowers verticillate. Corolla labiate. Stamens didynamous or 2 only, Ovary deeply 4 lobed, 4 seeded.

Leguminosæ.

Corolla papilionaceous in English plants. Stamens mono or diadelphous. Fruit a Legume or Lomentum.

Liliaceæ.

Plants with bulbs, rhizomes, or fibrous roots. Stamens 6, Anthers introrse. Ovary superior.

Melanthaceæ.

Plants with bulbs, corms, or fibrous roots. Stamens 6. Anthers extrorse. Ovary superior.

Papaveraceæ.

Calyx, Sepals 2 or 3. caducous. Stamens numerous, hypogynous. Ovary syncarpous. Fruit a Capsule.

Ranunculaceæ.

Corolla freqently absent, Stamens numerous, hypogynous. Carpels distinct.

Rosaceæ.

Leaves stipulate. Calyx persistent, often with an Epicalyx, Stamens numerous, perigynous. Fruit a Drupe, Pome, Etærio, Cynarrhodum, Achænium or Follicle.

Scrophulariaceæ.

Stamens didynamous or 2 only. Ovary 2 celled, many seeded.

Solanaceæ.

Leaves alternate, often geminate. Stamens 5, epipetalous. Ovary superior. Fruit Capsular or Baccate.

Umbelliferæ.

Leaves alternate, sheathing at the base. Infloresence an Umbel. Fruit a Cremocarp.

Iridaceæ.

Leaves linear, ensiform, Stamens 3, Anthers extrorse. Ovary inferior

PART 1.

Not to be sold unless

the purchaser is known to, or is introduced by some person known to, the seller:

ALSO

Entry to be made in Poison-Book.

OF

1. *Date of Sale;*
2. *Name and address of purchaser;*
3. *Name and quantity of article:*
4. *Purpose for which it is wanted;*

attested by signature:

AND

Must be labelled with

1. *Name of article;*
2. *The word "Poison."*
3. *Name and address of seller.*

Arsenic, and its preparations. (*For special regulations see below* *);

Aconite, and its preparations;

Alkaloids:—All poisonous vegetable alkaloids and their salts;

Atropine, and its preparations;

Cantharides;

Corrosive Sublimate;

Cyanide of Potassium, and all metallic cyanides and their preparations;

Emetic Tartar;

Ergot of Rye, and its preparations;

Prussic Acid, and its preparations;

Savin, and its oil;

Strychnine, and its preparations;

Vermin Killers, if preparations of poisons the preparations of which are in Part 1 of this schedule.

PART 2.

Must be labelled with

1. *Name of article,*
2. *The word "Poison."*
3. *Name and address of seller.*

Almonds, Essential Oil of (*unless deprived of Prussic Acid*);

Belladonna, and its preparations;

Cantharides, Tincture and all vesicating liquid preparations of;

Chloroform;

Chloral Hydrate, and its preparations;

Corrosive Sublimate, preparations of;

Morphia, preparations of;

Nux Yomica, and its preparations;

Opium, and its preparations; and preparations of Poppies;

Oxalic Acid;

Precipitate, Red (Red Oxide of Mercury);

Precipitate, White (Ammoniated Mercury);

Vermin Killers (see Part 1). Compounds containing "Poisons," prepared for the destruction of vermin, if not subject to the provisions of Part 1 are in Part 2.

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* It is unlawful to sell Arsenic or any of its preparations, unless, in addition to all the foregoing regulations, the following provisions of the Arsenic Act be also observed:—

1. That the poison, if colourless, be mixed with soot or indigo, so as to colour it.
2. That the person to whom the poison is sold or delivered be of mature age.
3. That the occupation, as well as the name and address, of the purchaser be entered in the poison-book.
4. That when the purchaser is not known to the seller, and is introduced by some person known to both, this person shall be present as a witness to the transaction, and shall enter his name and address in the poison-book.

116 Lead dioxide. PbO_2
117 Lead iodide. PbI_2
118 Lead nitrate. $Pb2NO_3$
119 Lead carbonate.
$2PbCO_3,Pb2HO$
120 Lead acetate. $Pb2C_2H_3O_2$
121 Silver oxide. Ag_2O
122 Silver nitrate. $AgNO_3$
123 Lithium carbonate. L_2CO_3
124 Lithium citrate.
$L_3C_6H_5O_7,4H_2O$
125 Manganese dioxide. MnO_2
126 Tin subchloride. $SnCl_2,2H_2O$
127 Cadmium iodide. CdI_2
128 Bismuth metal. Bi_2
129 Bismuth oxynitrate.
$BiONO_3,H_2O$
130 Bismuth ammonium citrate.
131 Bismuth oxide. Bi_2O_3
132 Bismuth oxycarbonate.
$(Bi_2O_2CO_3)_2H_2O$
133 Bismuth citrate. $BiC_6H_5O_7$
134 Paraffin.
135 Caustic, mitigated.
$A_9NO_3KNO_3$
136 Butyl-chloral hydrate.
$C_4H_5Cl_3O,H_2O$
137 Turpentine, oil of. $C_{10}H_{16}$
138 Sulphur sublimed. S_2
139 Sulphur precipitated. S_2
140 Bromine. Br_2
141 Iodine. I_2
142 Caffeine citrate.
$C_8H_{10}N_4O_2,H_3C_6H_5O_7$
143 Iodoform. CHI_3
144 Phosphorus. P_4
145 Cerium oxalate. $CeC_2O_4,3H_2O$
146 Acid acetic. $HC_2H_3O_2$
147 Acid Hydrochloric. HCl
148 Acid nitric. HNO_3
149 Acid sulphurous. H_2SO_3
150 Acid hydrobromic. HBr
151 Acid hydrocyanic. HCN
152 Acid acetic glacial. $HC_2H_3O_2$
153 Acid phosphoric. H_3PO_4
154 Acid oleic. $HC_{18}H_{33}O_2$
155 Acid lactic. $HC_3H_5O_3$
156 Acid tartaric. $H_2C_4H_4O_6$
157 Acid citric. $H_3C_6H_5O_7,H_2O$
158 Acid boric. H_3BO_3
159 Acid benzoic. $HC_7H_5O_2$
160 Acid tannic. $C_{27}H_{22}O_{17}$
161 Acid gallic. $H_3C_7H_3O_5,H_2O$
162 Acid meconic. $H_3C_7HO_7$
163 Acid chromic (Anhydride).
CrO_3
164 Acid salicylic. $HC_7H_5O_3$
165 Flux, black. $K_2CO_3+C_2$
165*a* Flux, white. K_2CO_3
166 Potassium chromate. K_2CrO_4
167 Potassium sulphocarbolate.
$KC_6H_5SO_4$
168 Potassium sulphocyanide.
$KCNS$
169 Potassium superoxalate.
KHC_2O_4
170 Potassium arseniate. K_2HAsO_4
171 Potassium manganate. K_2MnO_4
172 Sodium carbonate, exsic.
Na_2CO_3
173 Sodium hypochlorite. $NaClO$
174 Sodium hyposulphite.
$Na_2S_2O_3$
175 Sodium arseniate, exsic.
Na_2HAsO_4
176 Sodium ammonium phosphate.
$NaNH_4HPO_4$
177 Sodium tartrate. $Na_2C_4H_4O_6$
178 Sodium benzoate. $NaC_7H_5O_2$
179 Ammonium molybdate.
$(NH_4)_2MoO_4$
180 Barium oxalate. BaC_2O_4
181 Barium carbonate. $BaCO_3$
182 Barium chromate. $BaCrO_4$
183 Barium peroxide. BaO_2
184 Barium sulphide. BaS
185 Barium sulphate. $BaSO_4$
186 Strontium nitrate. $Sr2NO_3$
187 Strontium chloride. $SrCl_2$
188 Strontium carbonate. $SrCO_3$
189 Calcium tartrate. $CaC_4H_4O_6$
190 Calcium carbonate, marble.
$CaCO_3$
191 Calcium citrate. $Ca_32C_6H_5O_7$

192 Calcium sulphocarbolate. $Ca2C_6H_5SO_4$
193 Calcium sulphide. CaS
194 Magnesite. $MgCO_3$
195 French chalk. $MgSiO_3$
196 Talc. $MgSiO_3$
197 Magnesium metal. Mg_2
198 Asbestos. $MgSiO_3$
199 Alum, roche. $Al_23SO_4,K_2SO_4,24H_2O$
200 Alum exsic. Al_23SO_4,K_2SO_4
201 Aluminium metal. Al_2
202 Aluminium oxide. Al_2O_3
203 Zinc oxide (Hubbuck). ZnO
204 Zinc metal, powdered. Zn.
205 Zinc carbonate, native. $ZnCO_3$
206 Zinc sulphide (Blend). ZnS
207 Zinc sulphate, dried. $ZnSO_4H_2O$
208 Zinc phosphate. Zn_32PO_4
209 Zinc granulated. Zn.
210 Iron ammonium sulphate. $FeSO_4,(NH_4)_2SO_4,6H_2O$
211 Iron metal. Fe_2
212 Iron sulphate, exsic. $FeSO_4$
213 Iron pyrophosphate. $Fe_2P_2O_7$
214 Iron citrate. $Fe_22C_6H_5O_7$
215 Iron sulphide. FeS
216 Iron phosphate. Fe_32PO_4
217 Copper arseniate. Cu_32AsO_4
218 Copper phosphate. Cu_32PO_4
219 Copper oxide. CuO
220 Copper acetate. $Cu2C_2H_3O_2$
221 Copper arsenite. Cu_32AsO_3
222 Copper oxide, precipitated. CuO
223 Copper sulphide. CuS
224 Copper chloride. $CuCl_2$
225 Copper suboxide. Cu_2O
226 Copper sulphate, anhydrous. $CuSO_4$
227 Copper metal. Cu_2
228 Copper metal, fused. Cu_2
229 Mercury sulphide (vermilion). HgS
230 Mercury chromate. $HgCrO_4$
231 Mercury sulphide (Cinnabar). HgS
232 Mercury sulphide. HgS
233 Mercury oxysulphate. $Hg_3O_2SO_4$
234 Mercury sulphocyanide. $Hg2CNS$
235 Mercury acetate. $Hg2C$
236 Mercury cyanide. $Hg2C$
237 Mercury metal. Hg.
238 Arsenic anhydride. As_2O
239 Orpiment. As_2S_3
240 Antimony, crocus of. Sb_2S_3,Sb_2O_3
241 Lead hydrated oxide. Pb_2O2HO
242 Lead chromate. $PbCrO_4$
243 Lead oxide (Massicot). P
244 Lead oxide (Red) Pb_3O_4
245 Lead sulphate. $PbSO_4$
246 Lead bromide. $PbBr_2$
247 Lead chloride. $PbCl_2$
248 Lead sulphide. PbS
249 Lead metal. Pb_2
250 Manganese sulphate. MnS
251 Manganese oxide (native). MnO_2
252 Tin granulated. Sn_2
253 Tin (block). Sn_2
254 Tin peroxide. SnO_2
255 Cadmium metal. Cd
256 Cadmium bromide. $CdBr_2$
257 Sulphur (roll). S_2
258 Phosphorus, anhydrous. P_4
259 Phosphorus, pentoxide. P_2O
260 Acid oxalic $H_2C_2O_4.2H_2O$
261 Acid pyrogallic. $C_6H_6O_3$
262 Acid stearic. $HC_{18}H_{35}O_2$
263 Acid palmitic. $HC_{17}H_{33}O_2$
264 Acid picric. $C_6H_2(NO_2)_3OH$
265 Chrome ironstone. Cr_2O_3,Fe
266 Sulphur iodide. S_2I_2
267 Plumbago. C_2
268 Starch. $C_6H_{10}O_5$
269 Dextrin. $C_6H_{10}O_5$
270 Grape Sugar. $C_6H_{12}O_6$
271 Mannite. $C_6H_{14}O_6$
272 Vaseline.

B. & W. 204

E. A. Altree.

PREFACE.

This Elementary Edition of the "Materia Medica" is intended to give the student such information as he may require for the Medical and the Minor Examinations of the Pharmaceutical Society, and thus save time that might otherwise be lost in seeking it from larger manuals.

The increasing popularity of my book is a sufficient proof that a work of this kind was much needed.

The work is rendered more particularly useful by containing the following special features :—

1. A tabulated list of drugs, official and non-official, with the orders, sources, parts used, and all the preparations into which they enter.
2. The various methods for the extraction of the official alkaloids, estimations, &c.
3. The percentages of the different alkaloids, active principles, oils, resins, gums, &c., conveniently tabulated.
4. Tables of the various fruits.
5. The numbers preceding the names of the drugs refer to the numbered specimens in the Materia Medica Museum at the Westminster College of Chemistry and Pharmacy.
6. A resumé of the Official Animal Materia Medica.

G. S. V. WILLS.

Westminster College,
August, 1892.

NAME.	PARTS USED.	BOTANICAL OR ZOOLOGICAL SOURCE.
Acacia	The gum which exudes from the stem and branches	Acacia Senegal and other species of Acacia
Aconite Leaves...	Fresh leaves and flowering tops	Aconitum Napellus ... ...
Aconite Root ...	The dried root	Aconitum Napellus ... ...
Adeps	Internal fat of the abdomen	Sus Scrofa ... ...
Albumen	Liquid white of the egg	Gallus Bankiva ... ...
Alkanet Root ...	The dried root	Alkanna tinctoria ... ...
Aloe Barbadensis	Inspissated juice of the leaf	Aloe vulgaris ... ...
Aloe Socotrinæ ...	Inspissated juice of the leaf	Aloe Perryi and probably other species
Aloes Cape ...	Inspissated juice of the leaf	Aloe Spicata; Aloe Ferox ...
Amber	A fossil resin	Pinites Succinifer ... ...
Ammoniacum ...	Gum-resinous exudation from the stem	Dorema Ammoniacum ...
Amygdala Amara	The oil	Prunus Amygdalus ... ...
Amygdala Dulcis	Seed and oil	Prunus Amygdalus ... ..
Amylum	Starch	Triticum sativum; Zea Mays; Oryza sativa
Anethi Fructus...	Dried fruit	Peucedanum graveolen ...
Anisi Fructus ...	The oil	Pimpinella Anisum ... ...
Anisi Stellati Fructus	The oil	Illicium Anisatum ... ...
Anthemidis Flores	Dried single and double flower heads	Anthemis nobilis ... ...

ORDER.	HABITATS.	OFFICIAL PREPARATIONS.
Leguminosæ	Eastern Africa	Mist. Cretæ; Mist. Guaiaci; Mucil. Acaciæ; Pulv. Amygdalæ Co.; Pulv. Tragacanth Co., and in all the Trochisci.
Ranunculaceæ	Britain & Germany	Ext. Aconiti.
Ranunculaceæ	Britain & Germany	Aconitina, Lin. Aconiti, and Tinct. Aconiti.
Pachydermata	— —	Adeps Benzoatus; Emp. Cantharidis; Ung. Iodi.; Ung. Tereb.; Ung. Hyd. Nit.
Aves	Britain	— —
Boraginaceæ	South Europe	— —
Liliaceæ	Barbadoes	Aloin; Enema Aloes; Ext. Aloes Barb.; Pil. Aloes Barb.; Pil. Aloes et Ferri; Pil. Cambogiæ Co.; Pil. Colocynthidis et Hyoscyami.
Liliaceæ	Socotra	Aloin; Dec. Aloes Co.; Enema Aloes; Ext. Aloes Soc.; Ext. Colo. Co.; Pil. Aloes et Asafœtidæ; Pil. Aloes et Myrrhæ; Pil. Aloes Soc.; Pil. Rhei Co.; Tinct. Aloes; Tinct. Benzoini Co.; Vin. Aloes.
Liliaceæ	Cape of Good Hope	— —
Coniferæ	Northern Europe	— —
Umbelliferæ	Persia and the Punjaub	Emp. Ammoniaci cum Hydrargyro; Emp. Galbani; Mist. Ammoniaci; Pil. Scillæ Co.; Pil. Ipecac. cum Scilla.
Rosaceæ	Mogador	Ol. Phosphoratum 1%; Ung. Cetacei; Ung. Simplex; Ung. Resinæ.
Rosaceæ	Malaga	Ol. Amygdalæ; Pulv. Amygdalæ Co.; Mist. Amygdalæ.
Graminaceæ	— —	Glycerinum Amyli; Mucil. Amyli; Pulv. Tragacanthæ Co.; Sup. Acid. Tannici cum Sapone; Sup. Morphinæ cum Sapone.
Umbelliferæ	Great Britain and South Europe	Aq. Anethi; Ol. Anethi.
Umbelliferæ	Malta, Spain, Egypt, and Germany	Ess. Anisi; Aq. Anisi; Ol. Anisi; Tinct. Camph. Co.; Tinct. Opii Ammoniata.
Magnoliaceæ	China	— —
Compositæ	Indigenous	Ext. Anthemidis; Inf. Anthemidis; Ol. Anthemidis.

NAME.	PARTS USED.	BOTANICAL OR ZOOLOGICAL SOURCE.
Areca Nut ...	The ripe seed	Areca Catechu ... ...
Armoraciæ Radix	Fresh root	Cochlearia Armoracia ...
Arnicæ Rhizoma	Dried rhizome and rootlets	Arnica montana ... ...
Asafœtida ...	Gum-resin	Ferula Narthex and other species
Aurantii Flores	Flowers	Citrus vulgaris ... ...
Aurantii Cortex	The dried outer bark of the rind or pericarp	Citrus vulgaris ... ...
Aurantii Fructus	The ripe fruit	Citrus vulgaris ... ...
Balsamum Peruvianum	The balsam	Myroxylon Pereiræ ... ...
Balsamum Tolutanum	The balsam	Myroxylon Toluifera ...
Bay berries ...	The ripe berries ...	Laurus nobilis... ... ...
Barberry bark ...	The bark...	Berberis vulgaris ... ...
Belæ Fructus ...	The dried half-ripe fruit	Œgle Marmelos ... ...
Belladonnæ Folia	Fresh leaves and young branches	Atropa Belladonna ... .
Belladonnæ Radix	Dried root	Atropa Belladonna ... ...
Benzoinum ...	Balsamic resin	Styrax Benzoin and other species
Bladder Wrack ...	The entire plant ...	Fucus vesiculosus ... ...
Bryony, white ...	The dried root	Bryonia alba and B. dioica ...
Black Hellebore	The dried rhizome and rootlets	Helleborus Niger ... ...
Bloodroot ...	The dried root	Sanguinaria canadensis ...
Buchu Folia ...	Dried leaves	Barosma betulina: B. crenulata; B. serratifolia
Calumbæ Radix	The dried root	Jateorhiza Calumba ... ...
Cambogia ...	Gum-resin	Garcinia Hanburii ... ...
Camphora ...	A stearoptene	Cinnamomum Camphora ...

ORDER.	HABITATS.	OFFICIAL PREPARATIONS.
Palmaceæ ...	East Indies ...	—
Cruciferæ ...	Great Britain ...	Sp. Armoraceæ Co. Horseradish [illegible] [illegible] H₂O [illegible]
Compositæ ...	Central and South Europe	Tinct. Arnicæ.
Umbelliferæ ...	Afghanistan and Punjaub	Enema Asafœtidæ; Pil. Aloes et Asafœtidæ; Pil. Asafœtidæ Co.; Sp. Ammoniæ Fœtidus; Tinct. Asafœtidæ.
Aurantiaceæ ...	South Europe ...	Aq. Aurantii Floris.
Aurantiaceæ ...	South Europe ...	Inf. Aurantii; Inf. Aurantii Co.; Inf. Gentianæ Co.; Sp. Armoraciæ Co.; Tinct. Aurantii; Tinct. Cinchonæ Co.; Tinct.; Gentianæ Co.
Aurantiaceæ ...	South Europe ...	Tinct. Aurantii Recentis.
Leguminosæ ...	Salvador	— —
Leguminosæ ...	New Granada ...	~~Pil. Phosphori~~; Syr. Tolutanus; Tinct. Benzoini Co.; Tinct. Tolutana.
Lauraceæ ...	The Levant ...	— —
Berberidaceæ ...	Europe	— —
Aurantiaceæ ...	Malabar and Coromandel	Ext. Belæ Liquidum.
Solanaceæ ...	Great Britain and Germany	Ext. Belladonnæ 18; Succus Belladonnæ 15 m from leaves and branches; Tinct. Belladonnæ from leaves only. 15 m
Solanaceæ ...	Great Britain and Germany	Atropina; Lin. Belladonnæ; Ext. Belladonnæ Alcoholicum.
Styraceæ ...	Siam and Sumatra	Acid. Benzoicum; Adeps Benzoatus; Tinct. Benzoini Co.; Ung. Cetacei.
Algæ	Coasts of Britain	— —
Cucurbitaceæ ...	Indigenous ...	— —
Ranunculaceæ ...	Indigenous ...	— —
	North America, Canada	— —
Papaveraceæ ...		
Rutaceæ	Cape of Good Hope	Inf. Buchu; Tinct. Buchu.
Menispermaceæ .	Zambesia ...	Ext. Calumbæ; Inf. Calumbæ; Mist. Ferri Aromatica; Tinct. Calumbæ.
Guttiferæ ...	Siam	Pil. Cambogiæ Co.
Lauraceæ ...	China and Japan	Aq. Camphoræ; Lin. Aconiti; Lin. Belladonnæ; Lin. Camphoræ; Lin. Camph. Co. Sp. Camphoræ; Tinct. Camph. Co.; Ung Hydrarg. Co.; Lin. Chloroform Co.; Lin. Hydrargyri; Lin. Opii; Lin. Saponis; Lin. Sinapis Co.; Lin. Terebinthinæ; Lin. Terebinthinæ Aceticum.

NAME.	PARTS USED.	BOTANICAL OR ZOOLOGICAL SOURCE.
Canellæ Cortex ...	The bark deprived of its corky layer and dried	Canella alba ... ...
Cannabis Indica	The dried flowering or fruiting tops of the female plants	Cannabis sativa ... ...
Cantharis	The beetle dried ...	Cantharis Vesicatoria ...
Capsici Fructus	The dried ripe fruit ...	Capsicum fastigiatum ...
Capsicum ...	The dried pods	Capsicum annuum ... ...
Cardamomi Semina	The dried ripe seeds ...	Elettaria Cardamomum ...
Carui Fructus ...	The dried fruit	Carum Carui ... ...
Caryophyllum ...	The dried flower-bud ...	Eugenia Caryophyllata ...
Cascarillæ Cortex	Dried bark	Croton Eluteria ... ...
Castoreum ...	Dried preputial follicles and their secretions	Castor Fiber ... ...
Cassiæ Pulpa ...	Pulp obtained from the pods	Cassia Fistula ... ...
Cassiæ Bark ...	The dried bark	Cinnamomum Cassia ... ...
Catechu	An extract of the leaves and young shoots	Uncaria Gambier ... ...
Cera Alba **Cera Flava** } ...	Wax from the honeycomb	Apis Mellifica ... ...
Cerevisiæ Fermentum	Ordinary yeast	Saccharomyces ... ...

ORDER.	HABITATS.	OFFICIAL PREPARATIONS.
Canellaceæ ...	West Indies ...	~~Vinum Rhei~~.
Cannabinaceæ ...	India	Ext. Cannabis Indicæ; Tinct. Cannabis Indicæ.
Coleoptera ...	Hungary	1–10 Acetum Cantharidis; Charta Epispastica; Emp. Califaciens; Emp. Cantharidis; Liq. Epispastica; Tinct. Cantharidis; Ung. Cantharidis. 1 480
Solanaceæ ...	Zanzibar	Tinctura Capsici.
Solanaceæ ...	East Indies ...	— —
← Zingiberaceæ ...	Malabar	Ext. Coloc. Co.; Pulv. Cinnam. Co. Pulv. Cretæ Aromat.; Tinct. Card. Co.; Tinct. Gentian Co.; Tinct. Rhei; Vin Aloes.
Umbelliferæ ...	England & Germany	Aq. Carui; Conf. Opii; Conf. Piperis; Ol. Carui; Pulv. Opii Co.; Tinct. Card. Co.; Tinct. Sennæ.
Myrtaceæ ...	Penang & Bencoolen	Inf. Aurantii Co.; Inf. Caryophylli; Mist. Ferri Aromatica; Ol. Caryophylli; Vin. Opii.
Euphorbiaceæ ...	Bahama Island ...	Inf. Cascarillæ; Tinct. Cascarillæ.
Rodentia ... ... Umentata	Hudson's Bay ...	— —
Leguminosæ ...	East & West Indies	Confectio Sennæ.
Lauraceæ ...	India	— —
Cinchonaceæ ... Rubiacea	Singapore ...	Inf. Catechu; Pulv. Catechu Co., Tinct. Catechu; Trochsici Catechu.
Hymenoptera ...	— —	From White Wax.—Charta Epispastica; Ung. Cetacei; Ung. Simplex. From Yellow Wax.—Cera Alb.; Emp. Calefaciens; Emp. Cantharidis; Emp. Galbani; Emp. Picis; Emp. Saponis Fuscum; Pil. Phosphori; Ung. Cantharidis; Ung. Hyd. Co.; Ung. Picis Liq.; Ung. Resinæ; Ung. Sabinæ; Ung. Terebinthinæ.
Fungi	— —	~~Cataplasma Fermenti~~.

NAME.	PARTS USED.	BOTANICAL OR ZOOLOGICAL SOURCE.
Cetaceum ...	A concrete fatty substance mixed with oil, from the head of the sperm whale	Physeter Macrocephalus ...
Cetraria	The dried lichen ...	Cetraria Islandica ... ...
Chian Turpentine	Oleo-resin	Pistacia Terebinthus ...
Chinese Blistering Fly	— —	Mylabris Cichorii ... ...
Chirata	The dried plant ...	Ophelia Chirata ... ...
Chrysarobinum...	The medullary matter of the stem and branches	Andira Araroba ... ...
Cimicifugæ Rhizoma	The dried rhizome and rootlets	Cimicifuga racemosa ...
Cinchonæ Cortex	Dried bark	Cinchona Calisaya; C. succirubra; C. lancifolia
Cinchonæ Rubræ Cortex	Dried bark of the stem and branches of cultivated plants	Cinchona succirubra ...
Cinnamomi Cortex	The dried inner bark, the shoots from the truncated stock or stools of the cultivated trees	Cinnamomum Zeylanicum ...
Coca	Dried leaves	Erythroxylon Coca ... ...
Coccus	The dried female insect	Coccus Cacti ... ...
— —	— —	Coccus lacca ... ...
Colchici Cormus	Fresh and dried corm...	Colchicum autumnale ...
Colchici Semina	Ripe seeds	Colchicum autumnale ...
Colocynthidis Pulpa	Dried peeled fruit freed from the seeds .	Citrullus Colcynthis ..
Coltsfoot	Leaves	Tussilago farfara ... ...
Conii Folia ...	The fresh leaves and young branches	Conium maculatum ... ...
Conii Fructus ...	Dried fruit	Conium maculatum ... ...

ORDER.	HABITATS.	OFFICIAL PREPARATIONS.
Cetacea	Pacific Ocean	Charta Epispastica; Ung. Cetacei.
Lichens	North Europe	Decoctum Cetrariæ.
Anacardiaceæ	Grecian Archipel.	— —
Coleoptera	China	— —
Gentianaceæ	North India	Inf. Chiratæ; Tinct. Chiratæ.
Leguminosæ	India	Unguentum Chrysarobini.
Ranunculaceæ	North America	Ext. Cimicifugæ Liq.; Tinct. Cimicifugæ.
Cinchonaceæ	(Calisaya) Bolivia & S. Peru; (lancifolia) New Granada; (pallida) Loxa in Ecuador	Cinchonidinæ Sulph.; Cinchoninæ Sulph.; Quininæ Hydrochlor.; Quininæ Sulph.
Cinchonaceæ	W. Chimborazo	Dec. Cinchonæ; Ext. Cinch. Liq.; Inf. Cinch. Acid.; Mist. Ferri Arom.; Tinct. Cinchonæ; Tinct. Cinch. Co.
Lauraceæ	Ceylon	Acid. Sulph. Aromat.; Aq. Cinnam.; Dec. Hæmatoxyli; Inf. Catechu; Ol. Cinnam.; Pulv. Catechu Co.; Pulv. Cinnam. Co.; Pulv. Cretæ Aromat.; Pulv. Kino. Co.; Tinct. Card. Co.; Tinct. Catechu; Tinct. Cinnam.; Tinct. Lavandulæ Co.; Vin Opii.
Erythroxylaceæ	Bolivia and Peru	Ext. Cocæ Liq.; Cocainæ Hydrochlor.
Hemiptera	Mexico and Teneriffe	Tinct. Card. Co.; Tinct. Cinch. Co.; Tinct. Cocci.
— —	— —	— —
Melanthaceæ	Indigenous	Ext. Colchici; Ext. Colch. Aceticum; Vin. Colchici.
Melanthaceæ	Indigenous	Tinctura Colchici Seminum.
Cucurbitaceæ	Smyrna, Tricste, France and Spain	Ext. Coloc. Co.; Pil. Coloc. Co.; Pil. Coloc. et Hyoscyami.
Compositæ	Indigenous	— —
Umbelliferæ	Indigenous	Ext. Conii; Succus Conii.
Umbelliferæ	Indigenous	Tinctura Conii.

NAME.	PARTS USED.	BOTANICAL OR ZOOLOGICAL SOURCE.
Copaiba	Oleo-resin	Copaifera Langsdorffii and other species
Coriandri Fructus	Dried ripe fruit	Coriandrum sativum
Coto Bark	Dried bark	Palicurea densiflora
Couch Grass	The plant	Agropyrum repens
Cowhage	Hairs of legumes	Mucuna pruriens
Crocus	The dried stigma and top of the style	Crocus sativus
Crotonis Oleum	Oil from the seeds	Croton Tiglium
Cubeba	Dried unripe full-grown fruits	Piper Cubeba
Cumin	Dried fruit	Cuminum cyminum
Cuttle Fish Bone	The prepared mantle or hood of the fish	Sepia officinalis
Curare (Woorari)	Extractiform mass	Stychnos castalnanœna, &c.
Cuspariæ Cortex	Dried bark	Galipea Cusparia
Cusso	Dried panicles, chiefly of the female flowers	Hagenia Abyssinica
Cutch	Extract of heart-wood	Acacia catechu
Digitalis Folia	The leaf carefully dried	Digitalis purpurea
Dragon's Blood	A resinous exudation	Calamus Draco
Dulcamara	Young stem and branches	Solanum Dulcamara
Ecballii Fructus	The fruit very nearly ripe	Ecballium Elaterium
Elecampane	Dried root	Inula Helenium
Elemi	A concrete resinous exudation	Canarium commune (probably)
Elm Bark	Dried bark	Ulmus Campestris
Ergota	The sclerotium of claviceps purpurea, produced between the paleæ of the common rye and replacing the grain	Secale cereale
Euphorbia	— —	Euphorbia pilulifera
Erythrophlœum	Dried bark	Erythrophlleum guineense
Eucalypti Oleum	Oil distilled from the leaves	Eucalyptus globulus; Eucalyptus amygdalina
Eucalyptus Gummi	Gum	Eucalyptus rostrata, &c.
Euonymus Cortex	Dried bark	Euonymus atropurpureus

ORDER.	HABITATS.	OFFICIAL PREPARATIONS.
Leguminosæ	Banks of Amazon	Oleum Copaibæ.
Umbelliferæ	Great Britain	Conf. Sennæ; Ol. Coriandri; Syr. Rhei.; Tinct. Rhei.; Tinct. Sennæ.
Rubiaceæ	Bolivia	— —
Graminaceæ	Indigenous	— —
Leguminosæ	India, Africa, &c.	— —
Iridaceæ	Spain, France, and Italy	Dec. Aloes Co.; Pil. Aloes et Myrrhæ; Pulv. Cretæ Aromat.; Tinct. Cinchon. Co.; Tinct. Croci; Tinct. Opii Ammon.; Tinct Rhei.
Euphorbiaceæ	Ceylon	Oil.
Piperaceæ	Java	Oleo-resin Cubebæ; Ol. Cubebæ; Tinct. Cubebæ.
Umbelliferæ	Europe, &c.	— —
— —	— —	— —
Loganiaceæ	South America	— —
Rutaceæ	South America	Infusum Cuspariæ.
Rosaceæ	Abyssinia	Infusum Cusso.
Leguminosæ	East Indies and Ceylon	— —
Scrophulariaceæ	Indigenous	Inf. Digitalis; Tinct. Digitalis.
Palmaceæ	East Africa	— —
Solanaceæ	Indigenous	— —
Cucurbitaceæ	Indigenous	Elaterium.
Compositæ	Indigenous	— —
Amyridaceæ	Manilla	Unguentum Elemi.
Ulmaceæ	Indigenous	— —
Graminaceæ	Great Britain	Ext. Ergotæ Liq.; Inf. Ergotæ; Tinct. Ergotæ.
Euphorbiaceæ	Queensland	— —
Leguminosæ	Western Africa	— —
Myrtaceæ	Australia and Tasmania	Oil.
Myrtaceæ	Australia and Tasmania	— —
— —	— —	Ext. Euonymus Sicc. (Euonymin).

NAME.	PARTS USED.	BOTANICAL OR ZOOLOGICAL SOURCE.
Euphorbium	Gum resin	Euphorbia resiniferæ
Farina Tritici	The grain of wheat ground and sifted	Triticum sativum
Fel Bovinum Pur.	The purified gall of the Ox	Bos Taurus
Ficus	Dried fruit	Ficus Carica
Filix Mas	Dried rhizome with the persistent bases of the petioles	Aspidium Filix-mas
Fœniculi Fructus	The dried fruit of cultivated plants	Fœniculum Capillaceum
Fœnugreek	Dried seeds	Trigonella Fœnum-Græcum
Galbanum	Gum-resin	Ferula galbaniflua; F. rubricaulis; and probably other species
Galla	Excrescences caused by the puncture and deposit of an egg of Cynips Galæ tinctoriæ	Quercus lusitanica
Garlic	Dried bulb	Allium sativum
Gelsemium	Dried rhizome and rootlets	Gelsemium nitidum
Gentianæ Radix	Dried root	Gentiana lutea
Glycyrrhizæ Radix	Root and subterranean stem or stolon, fresh and dried	Glycyrrhiza glabra
Gossypium	Hairs of the seed	Gossypium barbadense and other species
Granati Radicis Cortex	Dried bark of the root	Punica Granatum
Grains of Paradise	Dried seeds	Amomum Melegueta
Grindelia	Dried plant	Grindelia squarrosa
Grindelia	Dried plant	Grindelia robusta
Guaiaci Lignum	Heart-wood reduced to chips	Guaiacum officinale or G. sanctum
Guaiaci Resina	Resin	Guaiacum officinale or G. sanctum
Guarana	Seeds, ground and moulded	Paullinia sorbilis
Gutta Percha	Concrete juice	Dichopsis Gutta and several other trees of the same natural order
Hamamelidis Cortex	Dried bark	Hamamelis Virginica

ORDER.	HABITATS.	OFFICIAL PREPARATIONS.
Euphorbiaceæ ...	Mogador	— —
Graminaceæ ...	Indigenous ...	Cataplasma Ferment.
Ruminantia ...	— —	— —
Artocarpaceæ ...	Smyrna	Confectio Sennæ.
Filices	Indigenous ...	Extractum Filicis Liquidum.
Umbelliferæ ...	Malta	Aq. Fœniculi; Pulv. Glycyrrhizæ Co.
Leguminosæ ...	Asia Minor ...	— —
Umbelliferæ ...	Persia	Emp. Galbani; Pil. Asafœtidæ Co.
Cupuliferæ ...	Asia Minor and Greece	Acid. Gallicum; Acid Tannicum; Tinct. Gallæ; Ung. Gallæ; Ung. Gallæ cum Opio.
Liliaceæ	Europe	— —
Loganiaceæ ...	Southern States of North America	Ext. Gelsemii Alcoholicum; Tinct. Gelsemii.
Gentianaceæ ...	Central and South Europe ...	Ext. Gentianæ; Inf. Gentianæ Co.; Tinct. Gentianæ Co.
Leguminosæ ...	Great Britain ...	Conf. Terebinthinæ; Dec. Sarsæ Co.; Ext.Glycyrrhizæ; Ext.Glycyrrhizæ Liq.; Inf. Lini.; Pil. Hydrarg.; Pil. Ferri Iodidi; Pulv.Glycerrhizæ Co.
Malvaceæ ...	Egypt, India, and America ...	Pyroxylin.
Myrtaceæ ...	South Europe ...	Dec. Granati Radicis.
Zingiberaceæ ...	West Coast of Africa	— —
Compositæ ...	California ...	— —
Compositæ ...	California ...	— —
Zygophyllaceæ ...	St. Domingo and Jamaica	Dec. Sarsæ Co.
Zygophyllaceæ ...	St. Domingo and Jamaica	Mist. Guaiaci; Pil. Hyd. Subchlor. Co.; Tinct. Guaiaci Ammoniata.
Sapindaceæ ...	Brazil	— —
Sapotaceæ ...	South India, Ceylon, Sumatra, and Borneo	Liquor Gutta Percha.
Hamamelaceæ ...	Canada and U.S.A.	Tinct. Hamamelidis.

NAME.	PARTS USED.	BOTANICAL OR ZOOLOGICAL SOURCE.
Fr. [illegible]	La. [illegible]	
Hamamelidis Folia	Dried leaves	Hamamelis Virginica ...
Hæmatoxyli Lignum	Sliced heart-wood ...	Hæmatoxylum Campechianum
Hellebore, black	Dried rhizome	Helleborus niger ... ...
HemidesmiRadix	Dried root	Hemidesmus indicus ...
Hirudo	Leech	Sanguisuga medicinalis (speckled); S. officinalis (green)
Hordeum decorticatum	Dried seed, deprived of its integuments ...	Hordeum distichon ... ...
Hyoscyami Folia Biennial.	Leaves and flowers, with or without branches	Hyoscyamus niger from bienn... plant.
Henbane Seeds ..	Dried seeds	Hyoscyamus niger ... ...
Ipecacuanha ...	Dried root	Cephaëlis Ipecacuanha ...
Irish Moss ...	Dried plant	Chondrus crispus ... ...
Jaborandi ...	Dried leaflets	Pilocarpus pennatifolius ...
Jalapa	Dried tubercules ...	Ipomæa purga... ... ...
Juniper	Oil from the unripe fruit	Juniperus communis... ...
Kamala	A powder which consists of the minute glands and hairs obtained from the surface of the fruits	Mallotus philippinensis ...
Kino	Juice from the trunk inspissated	Pterocarpus Marsupium ...
Krameriæ Radix	Dried root	Krameria triandria, K. Ixina
Lac	Fresh milk of the Cow...	Bos Taurus ... ...
Lactuca	Flowering herb	Lactuca virosa ... ...
Lactucarium ...	Inspissated latex ...	Lactuca virosa ... ...
Lauricis Cortex	Dried inner bark ...	Pinus Larix ... ...
Laurocerasi Folia	Fresh leaves	Prunus Laurocerasus ...
Lavandulæ Oleum	Flowers	Lavandula vera ... ...
Lily of Valley ...	Dried plant	Convallaria majalis ... ...
Limonis Cortex	The outer part of the rind or pericarp of the fresh fruit, and juice	Citrus Limonum ... ...

ORDER.	HABITATS.	OFFICIAL PREPARATIONS.
Hamamelaceæ	Canada and U.S.A.	Ext. Hamamelidis Liq.; Ung. Hamamelidis.
Leguminosæ	Campeachy	Dec. Hæmatoxyli; Ext. Hæmatoxy.
Ranunculaceæ	Indigenous	— —
Asclepiadaceæ	India	Syrupus Hemidesmi.
Sanguisuga	England and South Europe	— —
Graminaceæ	Great Britain	Decoctum Hordei.
Solanaceæ	Indigenous	Ext. Hyoscyami; Succus Hyoscyami; Tinctura Hyoscyami.
Solanaceæ	Indigenous	— —
Cinchonaceæ	Brazil	Pil. Conii. Co.; Pil. Ipecac. cum Scilla; Pulv. Ipecac. cum Scilla; Pulv. Ipecac. Co.; Trochisci Ipecacuanhæ; Trochisci Morphinæ et Ipecac; Vin. Ipecac.
Algæ	North Europe	— —
Rutaceæ	Pernambuco	Ext. Jaborandi; Inf. Jaborandi.
Convolvulaceæ	Mexico	Ext. Jalapæ; Pulv. Jalapæ Co.; Pulv. Scam. Co.; Resina Jalapæ; Tinct. Jalapæ.
Coniferæ	Europe	Oleum Spiritus Juniperi.
Euphorbiaceæ	India	— —
Leguminosæ	Malabar	Pulv. Catechu Co.: Pulv. Kino Co.; Tinct. Kino.
Polygalaceæ	Peru	Ext. Krameriæ; Inf. Krameriæ; Pulv. Catechu Co.; Tinct Krameriæ.
Ruminantia	— —	Mistura Scammonii.
Compositæ	Great Britain	Extractum Lactucæ.
Compositæ	Germany and Britain	— —
Coniferæ	Central Europe	Tinctura Laricis.
Rosaceæ	England	Aqua Laurocerasi.
Labiatæ	England	Lin. Camph. Co.; Sp. Lavandulæ; Tinct. Lavandulæ Co.
Liliaceæ	Indigenous	— —
Aurantiaceæ	South Europe	Inf. Aurantii Co.; Inf. Gent. Co.; Ol. Limonis; Syr. Limonis; Tinct. Limonis; Succus Limonis.

NAME.	PARTS USED.	BOTANICAL OR ZOOLOGICAL SOURCE.
Lini Semina	Seeds reduced to powder	Linum usitatissimum
Lobelia	Dried flowering herb	Lobelia inflata
Lupulus	Dried strobiles	Humulus Lupulus
Lycopodium	The spores	Lycopodium clavatum
Manna	Concrete saccharine exudation from the stem	Fraxinus Ornus
Marshmallow Root	Dried root	Althæa officinalis
Marrubium (Horehound)	Dried plant	Marrubium vulgare
Marigold	Dried florets	Calendula officinalis
Mastiche	Concrete resinous exudation from the stem and large branches	Pistacia Lentiscus
Maticæ Folia	Dried leaves	Piper angustifolium
Mel	Saccharine secretion deposited in the honeycomb	Apis mellifica
Mentha piperita (oleum)	Oil	Mentha piperita
Mentha viridis (oleum)	Oil	Mentha viridis
Menthol	Stearoptene obtained from the oil	Mentha arvensis, Mentha piperita
Mezerei Cortex	Dried Bark	Daphne Mezereum, and Laureola
Mica Panis	Crumb of bread made of wheaten flour	Triticum sativum
Morus	Juice of the ripe fruit	Morus nigra
Morrhuæ (oleum)	Oil from the fresh liver of the cod	Gadus Morrhuæ
Moschus	Dried secretion from the preputial follicles	Moschus moschiferus
Myristica	Dried seed divested of its hard coat or shell	Myristica fragrans
Myrrha	Gum-resin	Balsamodendron Myrrha
Nectandræ Cortex	Driod bark	Nectandra Rodiœi

ORDER.	HABITATS.	OFFICIAL PREPARATIONS.
Linaceæ	Great Britain ...	Farina Lini. ; Inf. Lini. ; Ol. Lini.
Lobeliaceæ ...	North America ...	Tinct. Lobeliæ ; Tinct. Lobeliæ Ætherea
Cannabinaceæ ...	Great Britain ...	Ext. Lupuli ; Inf. Lupuli ; Tinct. Lupuli.
Lycopodiaceæ ...	— —	— —
Oleaceæ	Calabria and Sicily	— —
Malvaceæ ...	Indigenous ...	— —
Labiatæ	Europe	— —
Compositæ ...	Europe	— —
Anacardiaceæ ...	Scio and the Levant	— —
Piperaceæ ...	Peru	Infusum Maticæ
Hymenoptera ...	Indigenous ...	Mel Depuratum.
Labiatæ	Indigenous ...	Aq. Menthæ Piperitæ ; Ess. Menth. Pip. ; Pil. Rhei Co. ; Sp. Menthæ 1-10) Piperitæ : Tinct. Chloroformi et Morphinæ.
Labiatæ	Indigenous ...	Aq. Menthæ Viridis.
Labiatæ	Japan and China	— —
Thymelaceæ ...	Indigenous ...	Dec. Sarsæ Co. ; Ext. Mezerei Æthereum.
Graminaceæ ...	— —	Cataplasma Carbonis.
Moraceæ	Asia Minor ...	— —
Acipenser (Genus)	— —	— —
Ruminantia ...	China and India...	— —
Myristicaceæ ...	Banda Island ...	Ol. Myristicæ et Expressum ; Pulv. Catechu Co. ; Pulv. Cretæ Aromaticus ; Sp. Armoraceæ Co. ; Tinct. Lavandulæ Co.
Amyridaceæ ...	Arabia Felix and Abyssinia	Dec. Aloes Co. ; Mist. Ferri Co. ; Pil. Aloes et Myrrhæ ; Pil. Asafœtidæ Co. ; Pil. Rhei Co. ; Tinct. Myrrhæ.
Lauraceæ ...	British Guiana ...	Beberinæ Sulphas.

NAME.	PARTS USED.	BOTANICAL OR ZOOLOGICAL SOURCE.
Nux Vomica ...	Seeds	Strychnos Nux-vomica ...
Olibanum ...	Gum-resin	Boswellia Carterii ... ...
Olivæ Oleum ...	Oil obtained from the ripe fruit	Olea europea ... ...
Orris root ...	Dried rhizome	Iris florentina... ... ...
Opium	Inspissated juice from the unripe capsules	Papaver somniferum ...
Ovi Vitellus ...	Yolk of the egg... ...	Gallus Bankiva ... ...
Papaveris Capsulæ	Nearly ripe capsules, dried	Papaver somniferum ... ...
Pareiræ Radix ...	Dried root	Chondrodendron tomentosum
Physostigmatis Semen	Dried seeds	Physostigma venenosum ...
Pimenta	Dried unripe full-grown fruits	Pimenta officinalis ... ...
Piper nigrum ...	Dried unripe fruits ...	Piper nigrum ... ...
Pod Pepper ...	Dried spikes	Piper longum ... ...
Pix Burgundiceæ	Resinous exudation from the stem	Pinus Picea ... ...
Pix Liquida ...	Bituminous liquid obtained from the wood	Pinus sylvestris and other species
Podophyllum Rhizoma	Dried rhizome and rootlets	Podophyllum peltatum ...
Pomegranate root bark	Dried bark of root ...	Punica granatum ... ...
Prunum ...	Dried fruit	Prunus domestica ... ...
Pterocarpi Lignum	Heart wood	Pterocarpus santalinus ...
Pyrethri Radix...	Dried root	Anacyclus Pyrethrum ...
Pyrethrum leaves	— —	Pyrethrum cinerariæfolium...
Quassiæ Lignum	Chips, shavings, or raspings of the wood	Picræna excelsa ... ...
Quercus Cortex...	Dried bark of small branches and young stems	Quercus Robur ... ...
Pyrus (Quince)...	Dried seeds	Pyrus cydonia... ... ...
Resina	The residue left after the distillation of oil of turpentine from the crude oleo-rosin	Various species of Pines ...

ORDER.	HABITATS.	OFFICIAL PREPARATIONS.
Loganiaceæ ...	East Indies and Ceylon	Ext. Nucis Vomicæ; Stychnina; Tinct. Nucis Vomicæ.
Burseraceæ ...	Africa	— —
Oleaceæ	South Europe ...	Emplastra, Linimenta, and Unguenta; Charta Epispastica; Enema Mag. Sulph.
Iridaceæ	South Europe ...	— —
Papaveraceæ ...	Asia Minor ...	Numerous preparations.
Aves (class) ...	— —	Mist. Spiritus Vini Gallici.
Papaveraceæ ...	Great Britain ...	Dec. Papaveris; Ext. Papaveris; Syr. Papaveris.
Menispermaceæ	Brazil	Dec. Pareiræ; Ext. Pareiræ.
Leguminosæ ...	West Africa ...	Extractum Physostigmatis.
Myrtaceæ ...	West Indies ...	Aq. Pimentæ; Ol. Pimentæ.
Piperaceæ ...	East Indies ...	Conf. Opii; Conf. Piperis; Pulvis Opii Co.
Piperaceæ ...	India and Ceylon	— —
Coniferæ	Switzerland ...	Emp. Ferri.; Emp. Picis.
Coniferæ	Russia, Finland and Sweden	Unguentum Picis liquidæ.
Ranunculaceæ ...	North America ...	Resina Podophylli.
Myrtaceæ ...	Asia Minor ...	— —
Rosaceæ	South Europe ...	Confectio Sennæ.
Leguminosæ ...	Ceylon and Coromandel	Tinctura Lavandulæ Co.
Compositæ ...	Spain and Africa	Tinctura Pyrethri.
Compositæ ...	— —	— —
Simarubaceæ ...	Jamaica	Ext. Quassiæ; Inf. Quassiæ; Tinct. Quassiæ.
Cupuliferæ ...	Great Britain ...	Decoctum Quercus.
Rosaceæ	Asia Minor ...	— —
Coniferæ	North America ...	Charta Epispastica; Ung. Terebinthinæ; Unguentæ Resinæ, Calefaciens, Cantharidis, Picis, Plumb. Iodidi, Saponis.

NAME.	PARTS USED.	BOTANICAL OR ZOOLOGICAL SOURCE.
Rhamni Frangulæ Cortex	Dried bark	Rhamnus frangula ... ...
Rhamnus Purshiani	Dried bark	Rhamnus Purshianus ...
Rhei Radix ...	Dried root more or less deprived of its bark	Rheum palmatum, R. officinale, and other species
Rhæados Petala	Fresh petals	Papaver Rhœas ... ...
Ricini (oleum) ...	Oil expressed from the seeds	Ricinus communis ... ...
Rosæ Caninæ Fructus	Ripe fruits	Rosa canina, and other indigenous allied species
Rosæ centifoliæ Petala	Fresh fully-expanded petals	Rosa centifolia ... ...
Rosæ Gallicæ Petala	Fresh and dried unexpanded petals	Rosa Gallica ... ...
Rosmarini (oleum) ...	Oil distilled from the flowering tops	Rosmarinus officinalis ...
Rutæ (oleum) ...	Oil distilled from the herb	Ruta graveolens ... ...
Sabadilla... ...	Dried ripe seeds freed from their pericarps	Schœnocaulon officinale ...
Sabinæ Cacumina	Fresh and dried tops ...	Juniperus Sabina ... ...
Saccharum Lactis	Crystallized sugar, obtained from the whey of milk by evaporation	Bos Taurus ... ...
Saccharum Purificatum	Juice from the stem ...	Saccharum officinarum ...
Sambuci Flores...	Fresh flowers	Sambucus nigra ... ...
Sandarach ...	Gum-resin	Callitris quadrivalis ... ...
Santali (oleum)	Volatile oil distilled from the wood	Santalum album ... ...
Santonica ...	Dried unexpanded flower-heads	Artemisia maritima ... ...
Sarsæ Radix ...	Dried root	Smilax officinalis ... ...

ORDER.	HABITATS.	OFFICIAL PREPARATIONS.
Rhamnaceæ	Europe	Ext. Rhamni Frangulæ; Ext. Rhamni Frangulæ Liq.
Rhamnaceæ	North America	Ext. Cascaræ Sagradæ et Liquidum.
Polygonaceæ	China, C. Tartary and Thibet	Ext. Rhei; Inf. Rhei; Pil. Rhei Co.; Pulv. Rhei Co.; Syr. Rhei; Tinct. Rhei; Vin. Rhei.
Papaveraceæ	Great Britain	Syrupus Rhæados.
Euphorbiaceæ	South Asia, Egypt, Italy, and United States	Collodium Flexile; Lin. Sinapis Co.; Pil. Hyd. Subchlor. Co.
Rosaceæ	Great Britain	Confectio Rosæ Caninæ.
Rosaceæ	Great Britain	Aqua Rosæ.
Rosaceæ	Great Britain	Conf. Rosæ Gallicæ; Inf. Rosæ Acidum; Syr. Rosæ Gallicæ.
Labiatæ	South Europe and Asia Minor	Lin. Saponis; Sp. Rosmarini; Tinct. Lavandulæ Co.
Rutaceæ	England	— —
Melanthaceæ	Mexico	Veratrina.
Coniferæ	Great Britain	Ol. Sabinæ; Tinct. Sabinæ; Ung. Sabinæ.
Ruminantia	— —	Pulv. Elaterini Co.
Graminaceæ	West Indies	Conf. Rosæ Caninæ, Gallicæ, and Sennæ; Ext. Sarsæ Liquidum; Ferri Carb. Sac.; Liq. Calcis Sac.; Mist. Ferri Co.; Mist. Guaiaci; Mist. Sp. Vini Gallici; Pil. Ferri Iodidi; Pulv. Amygd. Co.; Pulv. Cretæ Aromat; Pulv. Glycyrrhizæ Co.; Pulv. Trag. Co.; Sodii Citro-tartras Eff.; all the Syrups and Lozenges.
Caprifoliaceæ	Great Britain	Aqua Sambuci
Coniferæ	Mogador	— —
Santalaceæ	East Indies, Tropical Asia, and Australia	— —
Compositæ	Russia	Santoninum.
Smilaceæ	Jamaica	Dec. Sarsæ; Dec. Sarsæ Co.; Ext. Sarsæ Liq.

NAME.	PARTS USED.	BOTANICAL OR ZOOLOGICAL SOURCE.
Sassafras Radix	Dried root	Sassafras officinale
Scammoinæ Radix	Dried root	Convolvulus Scammonia
Scammoniæ Resina	Resin from the root	Convolvulus Scammonia
Scammonium	Gum-resin obtained from the living root	Convolvulus Scammonia
Scilla	Dried and sliced bulb	Urginea Scilla
Scoparii Cacumina	Fresh and dried tops	Cyticus scoparius
Senegæ Radix	Dried root	Polygala Senega
Senna Alexandrina	Dried leaflets	Cassia acutifolia
Senna Indica	Dried leaflets	Cassia angustifolia
Serpentariæ Rhizoma	Dried rhizome and rootlets	Aristolochia Serpentaria or Aristolochia reticulata
Sevum Præparatum	Internal fat of the abdomen of the sheep	Ovis Aries
Simaruba bark	Dried bark	Simaruba amaru
Sinapis alba Semina	Seeds	Brassica alba
Sinapis nigra Semina	Seeds	Brassica nigra
Slippery elm bark	Dried bark	Ulmus fulva
Sponge	Dried skeleton	Spongia officinalis
Soap bark	Dried bark	Quillaia Saponaria
Solanum	Leaves and young branches	Solanum dulcamara
Spigelia	Dried herb	Spigelia marylandica
Staphisagriæ Semina	Dried ripe seeds	Delphinium Staphisagria
St. Ignatius Bean	The seed	Strychnos amara
Stramonii Semina	Dried ripe seeds	Datura Stramonium
Strophanthus	Ripe seeds	Strophanthus hispidus
Styrax Præparatus	Balsam from the inner bark, purified	Liquidambar orientalis
Sumbul Radix	Dried sections of the root	Ferula Sumbul
Sweet Flag	Dried rhizome	Acorus calamus

ORDER.	HABITATS.	OFFICIAL PREPARATIONS.
Lauraceæ ...	North America ...	Dec. Sarsæ Co.
Convolvulaceæ...	Syria & Asia Minor	Resina Scammoniæ.
Convolvulaceæ ...	Syria & Asia Minor	Conf. Scammonii; Ext. Colocynth Co.; Pil. Colocynthidis Co.; Pil. Scammonii Co.; Pulv. Scammonii Co.
Convolvulaceæ ...	Syria & Asia Minor	Mist. Scammonii; Resina Scammoniæ.
Liliaceæ	Mediterranean ...	Acetum Scillæ; Ox. Scillæ; Pil. Ipecac. cum Scilla; Pil. Scillæ Co.; Syr. Scillæ; Tinct. Scillæ.
Leguminosæ ...	Great Britain ...	Dec. Scoparii; Succus Scoparii.
Polygalaceæ ...	North America ...	Inf. Senegæ; Tinct. Senegæ.
Leguminosæ ...	Egypt and Nubia	Conf. Sennæ; Inf. Sennæ; Mist. Sennæ Co.; Pulv. Glycyrrhizæ Co.; Syr. Sennæ; Tinct. Sennæ.
Leguminosæ ...	Southern India...	Same as S. Alexandrina.
Aristolochiaceæ	North America ...	Inf. Serpentariæ; Tinct. Cinchonæ Co.; Tinct. Serpentariæ.
— —	— —	Emp. Cantharidis; Ung. Hydrargyri.
Simarubaceæ ...	Brazil & W. Indies	— —
Cruciferæ ...	Great Britain ...	Cataplasma Sinapis; Charta Sinapis; Oleum Sinapis.
Cruciferæ ...	Great Britain ...	Cataplasma Sinapis; Charta Sinapis; Oleum Sinapis.
Ulmaceæ	United States ...	— —
Class:—Porifera	Turkey and Bahama Islands	— —
Rosaceæ	Chili and Peru ...	— —
Solanaceæ ...	Europe	— —
Loganiaceæ ...	South States of America	— —
Ranunculaceæ ...	South Europe ...	Unguentum Staphisagriæ.
Loganiaceæ ...	Philippine Islands	— —
Solanaceæ ...	Great Britain ...	Ext. Stramonii; Tinct. Stramonii.
Apocynaceæ ...	Tropical Africa ...	Tinctura Strophanthi.
Liquidambaraceæ	Asia Minor ...	Tinct. Benzoini Co.
Umbelliferæ ...	Russia & India ...	Tinct. Sumbul.
Araceæ	Europe and America	— —

NAME.	PARTS USED.	BOTANICAL OR ZOOLOGICAL SOURCE.
Tabaci Folia ...	Dried leaves	Nicotiana Tabacum ... ...
Tamarindus ...	Preserved pulp of the fruit	Tamarindus indica ... ...
Taraxaci Radix	Fresh and dried root ...	Taraxacum officinale ...
Terebinthina Canadensis	Turpentine, known as Canada Balsam	Pinus balsamea .. ...
Theobromatis oleum	Concrete oil	Theobroma Cacao ... ...
Theriaca	Uncrystallizable residue left in refining of sugar	Saccharum officinarum ...
Thus Americanum	Concrete turpentine ...	Pinus Tæda, P. australis ...
Thymol	Stearoptene obtained from the volatile oils	Thymus vulgaris, Monarda punctata, and Carum Ajowan ... ...
Tonquin bean ...	Dried seed	Dipteryx odorata ... ...
Tragacantha ...	Gummy exudation from the stem	Astragalus gummifer ...
Uvæ Ursi Folia	Dried leaves	Arctostaphylos Uva Ursi ...
Uvæ	Ripe fruit	Vitis vinifera ... ...
Valerianæ Rhizoma	Dried rhizome and rootlets	Valeriana officinalis ... ...
Vanilla	Dried fruit	Vanilla planifolia .. ...
Veratri Viridis Rhizoma	Dried rhizome and rootlets	Veratrum viride ... ...
White Veratrum	Dried rhizome and rootlets	Veratrum album ... ...
Wild Cherry Bark	Dried bark	Prunus serotina ... ...
Zingiber	Scraped and dried rhizome	Zingiber officinale ... ...

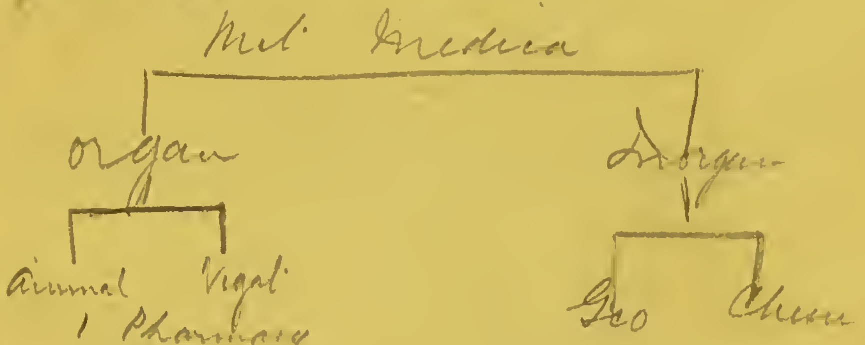
ORDER.	HABITATS.	OFFICIAL PREPARATIONS.
Solanaceæ ...	America	— —
Leguminosæ ...	West Indies ...	Confectio Sennæ.
Compositæ ...	Great Britain ...	Dec. Taraxaci (dried root); Ext. Taraxaci (fresh root); Ext. Taraxaci Liquidum (dried root); Succus Taraxaci (fresh root).
Coniferæ ...	Canada	Charta Epispastica; Collodium flexile.
Sterculiaceæ ...	S. America and Mexico	The suppositories.
Graminaceæ ...	S. America, India, and Mexico	Tinct. Chloroformi et Morph., and numerous Pill masses.
Coniferæ	N. America ...	Emplastrum Picis.
Labiatæ	S. Europe and U. States	— —
Leguminosæ ...	Brazil and Guiana	— —
Umbelliferæ ...	India, Persia, and Egypt	— —
Leguminosæ ...	Asia Minor ...	Conf. Opii.; Conf. Sulphuris; Gly. Tragacanthæ; Mucilago Tragacanthæ; Pulv. Opii. Co.; Pulv. Tragacanthæ Co.
Ericaceæ	England	Inf. Uvæ Ursi.
Vitaceæ	Spain	Tinct. Card. Co.; Tinct. Sennæ.
Valerianaceæ ...	Great Britain ...	Inf. Valer.; Tinct. Valer.; Tinct. Valerianæ Ammoniata.
Orchidaceæ ...	Mexico	— —
Melanthaceæ ...	U. States and Canada	Tinct. Veratri Viridis.
Melanthaceæ ...	U. S. America ...	— —
Rosaceæ	N. America ...	— —
Zingiberaceæ ...	West Indies & India	Syr. Zingib.; Tinct. Zingib.; Tinct. Zingiberis fortior; Conf. Opii.; Conf. Scammonii; Inf. Sennæ; Pil. Scillæ Co.; Pulv. Cinnamoni Co.; Pulv. Jalapæ Co.: Pulv. Opii. Co.; Pulv. Rhei Co.; Pulv. Scammonii Co.; Vin. Aloes.

TABLE OF NATURAL ORDERS UNDER THE VARIOUS SUB-CLASSES, &c.

DICOTYLEDONES.					MONOCOTYLEDONES.	
Thalamifloræ.	Calycifloræ.	Corollifloræ.	Monochlamydeæ	Gymnospermia.	Petaloideæ.	Glumaceæ.
Aurantiaceæ.	Anacardiaceæ.	Asclepiadaceæ.	Aristolochiaceæ.	Coniferæ.	Araceæ	Graminaceæ.
Byttneriaceæ.	Amyridaceæ.	Boraginaceæ.	Artocarpaceæ.		Iridaceæ.	
Cruciferæ.	Araliaceæ.	Compositæ.	Cupuliferæ.		Liliaceæ.	
Camelliaceæ.	Cucurbitaceæ.	Caprifolaceæ.	Cannabinaceæ.		Melanthaceæ.	
Canellaceæ.	Leguminosæ.	Convolvulaceæ.	Hamamelideæ.		Smilaceæ.	
Erythroxyllaceæ	Myrtaceæ.	Ericaceæ.	Euphorbiaceæ.		Zingiberaceæ.	
Guttiferæ.	Rhamnaceæ.	Gentianaceæ.	Lauraceæ.			
Linaceæ.	Rosaceæ.	Labiatæ.	Myristicaceæ.		ACOTYLEDONES.	
Magnoliaceæ.	Umbelliferæ.	Lobeliaceæ.	Polygonaceæ.			
Malvaceæ.		Loganiaceæ.	Piperaceæ.			
Menispermaceæ.		Oleaceæ.	Salicaceæ.		Acrogenæ.	Thallogenæ.
Papaveraceæ.		Rubiaceæ.	Santalaceæ.			
Polygalaceæ.		Sapotaceæ.	Thymelaceæ.		Filices.	Algæ.
Rutaceæ.		Styraceæ.	Ulmaccæ.			Fungi.
Ranunculaceæ.		Solanaceæ.				Lichenes.
Sapindaceæ.		Srcophulariaceæ.				
Simarubaceæ.		Valerianaceæ.				
Vitaceæ.						
Zygophyllaceæ.						

M. Medica

Is a science which teaches us of the usage of drugs in medicine.



1 Pharmacy
2 Pharmacy
3 Therapeutics

ELEMENTARY
MATERIA MEDICA.

DE CANDOLLE'S

In this system plants are classified according to their essential organs,

THE VEGETABLE KINGDOM

1. Phanerogamia.

Flowering or Cotyledonous Plants, propagated by seeds, having a visible embryo. This is divided into 2 sub-classes.

1. Monocotyledones or Endogens.

Seeds containing one cotyledon, germination endorhizal, parallel veined leaves, parts of the flower arranged in "threes."

These are divided into :—

1. Glumaceæ.

Leaves usually permanent, no petals or sepals, flowers enclosed in bracts called glumes and paleæ.

2. Petaloideæ.

Leaves usually permanent, perianth verticillate, sometimes absent.

This sub-class has 3 subdivisions :—

1. Epigynæ.—Flowers hermaphrodite, perianth adherent, ovary inferior.
2. Hypogynæ.—Flowers hermaphrodite, perianth free, ovary superior.
3. Diclines.—Flowers unisexual, perianth either absent or consisting of scales.

3. Dictyogenæ.

Leaves reticulated, deciduous floral envelope verticillate, wood arranged in the roots in a concentric manner.

2. Dicotyledones or Exogens.

Seeds containing two cotyledons, germination exorhizal, reticulated leaves, parts of the flower arranged in "fours" or "fives."

Dicotyledones are divided into :—

1. Gymnospermia.

Ovules naked or not enclosed in an ovary ; they are fertilized directly by the action of the pollen on the ovules.

Example.—Coniferæ.

2. Angiospermia.

Ovules enclosed in an ovary, and fertilized indirectly by the action of the pollen on the stigma.

Angiospermia is divided into 4 sub-classes :—

1. **Thalamifloræ.**
2. **Calycifloræ.**
3. **Corollifloræ.**
4. **Monochlamydeæ.**

(*For the description of these, see next page.*)

NATURAL SYSTEM.

he growth of the stems, and the number of their cotyledons or seed-leaves.

s divided into 2 sub-kingdoms.

2. Cryptogamia.

Flowerless or Acotyledonous Plants, propagated by spores instead of seeds, germination heterorhizal, leaves when present, with furcate venation; divided into 2 sub-classes.

1. Thallogneæ.

Which have no distinction between stems and leaves, and have no stomata.

Examples.—Algæ, Fungi, Lichenes.

2. Acrogenæ.

Which have a distinguishable stem, and possess stomata.

Example.—Filices.

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1. Thalamifloræ.

Calyx and corolla, petals distinct, inserted on thalamus, stamens hypogynous, or adherent to the sides of the ovary.

2. Calycifloræ.

Calyx and corolla, petals usually distinct, inserted on the calyx, stamens perigynous or epigynous.

This is divided into 2 sub-divisions.

1. Perigynæ.

Calyx free, stamens perigynous, ovary superior.

2. Epigynæ.

Calyx adherent, stamens epigynous, ovary inferior.

3. Corollifloræ.

Usually both sepals and petals, petals united, stamens inserted on the corolla or ovary, or free and arising from the thalamus.

This sub-class is divided into 3 sub-divisions:—

1. Epigynæ.—Calyx adherent, ovary inferior.
2. Hypostamineæ.—Stamens hypogynous, ovary superior.
3. Epipetalæ.—Corolla hypogynous, stamens epipetalous, ovary superior.

4. Monochlamydeæ.

No petals, sepals only, these sometimes absent. This includes Euphorbiaceæ.

Roots . in Autumn & spring
Bark
Fruits [illegible] fully ripe

Alkaloids.
[illegible]

SUB-KINGDOM.—**Phanerogamia.**

CLASS.—**Dicotyledones.**

SUB-CLASS.—**Thalamifloræ.**

RANUNCULACEÆ.

No. 1. Aconiti Folia. *Aconite Leaves.*

The fresh leaves and flowering tops of Aconitum Napellus, *Monkshood,* gathered when about one-third of the flowers are expanded, from plants cultivated in Britain. The reason for gathering at this period is that those compounds which are simply of use as nutrition for the growth of the plant may be taken up to form new tissues, the secretions necessarily becoming concentrated by their removal.

Habitat.—Britain; where the plant is cultivated.

Characters.—Leaves alternate, with long channelled stalks, very deeply cut palmately into three or five segments, which are again deeply and irregularly divided into oblong acute narrow lobes; exciting slowly, when chewed, a sensation of tingling and numbness.

The leaves are far less active than the root, and are reported to possess one-sixth of its activity.

Official Preparation.—Extractum Aconiti.

No 2. Aconiti Radix. *Aconite Root.*

The dried root of Aconitum Napellus, collected in winter or early spring before the leaves have appeared, from plants cultivated in Britain, and carefully dried; or imported in a dried state from Germany. The object of the root being collected before the appearance of the leaves, is that in proportion to the growth above ground, so is the loss underground.

Habitat.—Cold climates of Europe.

Ranunculaceæ.

Characters.—Usually from about two to three inches long, and from half to three-quarters of an inch thick at the upper extremity, where it is usually crowned with the remains of the base of the stem; conical in form, much shrivelled longitudinally, and more or less covered with scars or bases of broken rootlets; dark brown externally, whitish within, and having a central cellular axis with about seven rays. No marked odour; taste at first somewhat bitterish-sweet, but exciting slowly, when chewed after some minutes, a sensation of tingling and numbness, which lasts for some time.

Aconite root has been sometimes mistaken for horseradish root, from which it may be distinguished by the following marked characters:—

Aconite Root	**Horseradish Root**
is from two to three inches long, conical and terminating in a point, coffee-coloured, possessing no pungent smell, and turns pink when the fresh root is scraped or cut.	is generally three or four times as long as aconite root, cylindrical, and terminating rather abruptly, of a light yellow colour, possessing a very pungent odour, especially when scraped. It does not turn pink when scraped or cut.

Composition.—Aconite root contains about ·03 per cent. of the alkaloid Aconitine, united with aconitic acid, amorphous aconitine, napelline, resin and fatty matter.

Therapeutics.—Aconite root is used in acute inflammatory diseases to diminish fever.

Official Preparations.—Tinct. Aconiti; Lin. Aconiti; Aconitina; Ung. Aconitinæ.

Japanese Aconite Root is obtained from Aconitum Fischeri.

Characters.—The dried root is of an ash grey colour, smooth externally, with a few thickened rootlets or scars. It varies from one to two inches in length; internally it presents a white appearance, and contains a large amount of starch.

Ranunculaceæ.

This root is distinguished from the root of Aconitum Napellus by its lighter colour externally, and its less wrinkled appearance.

Nepaul or Indian Aconite Root is obtained from Aconitum ferox. This root presents a wrinkled and contracted appearance; it is two or three times as large as German aconite root, and is externally of a dirty brown colour, and the leaf scars are more frequently visible on the side just below the top of the root than at its summit.

Composition.—Similar to Aconitum Napellus, pseudaconitine being the principal alkaloid.

No. 3. Podophylli Rhizoma. *Podophyllum Rhizome.*

The dried rhizome of Podophyllum peltatum or the American *May Apple.* It is this rhizome which is called mandrake in the United States. Podoph. Americ. or May

Habitat.—United States of North America.

Characters.—Podophyllum root, as it is sometimes called, is known to be a rhizome by its producing buds and leaves on its upper surface, and rootlets from its lower surface. Along the rhizome at intervals more or less flattened and swollen portions are found presenting on their upper surfaces a number of rings, produced by the falling off of the leaves, and on their lower surfaces white scars, due to the detachment of the brittle rootlets. Sometimes the rootlets themselves are found on the rhizome.

Composition.—The chief active ingredient is a resin partly soluble in ether, the soluble portion alone being purgative. These resins form the Podophyllin of commerce.

Therapeutics.—The Resin or Podophyllin acts as a drastic purgative. Dose, from $\frac{1}{4}$ gr. to 2 gr.

Official Preparation.—Podophylli Resina.

No. 4. Hydrastis canadensis. *Yellow Root.*

(Not official.)

The dried rhizome and rootlets of the Hydrastis canadensis, commonly known as Yellow Root, Orange Root, or Golden Seal.

Ranunculaceæ.

Habitat.—United States.

Characters.—Its length averages from half an inch to an inch and a half, much twisted and knotted; on the upper surface are scars produced by the decay of the aërial stems. At first it has a yellowish-brown colour, becoming darker on keeping.

Canadine

Insoluble in Ether *Composition.*—Berberine and hydrastine.

Therapeutics.—Used as a tonic for the mucous membrane.

No. 5. Hellebori Nigri Rhizoma. *Black Hellebore Rhizome.*

(Not official.) contains no tannic acid

The dried rhizome and rootlets of the Helleborus niger, Black Hellebore, or *Christmas Rose.*

Habitat.—Central Europe.

Adulterations.—Black Hellebore rhizome may be confounded with that of Cimicifuga racemosa, from which it may be readily distinguished by the following character:—On making a traverse section of a rootlet of Black Hellebore, the meditullium appears as one mass, not being visibly divided in any way.

On treating a rootlet of Cimicifuga in a similar manner, the meditullium is seen to be divided like a Maltese cross.

The rhizomes of Helleborus viridis and Helleborus fœtidus are occasionally substituted for black Hellebore rhizome; this substitution, however, matters little, as they possess as much activity as the true drug.

Composition.—Helleborin and helleboreïn; the former is a powerful poison. Hellebore rhizome does not contain tannin, and may thus be distinguished from Cimicifuga.

Therapeutics.—Black Hellebore is a drastic purgative and emmenagogue.

No. 6. Staphisagriæ Semina. *Stavesacre Seeds.*

The dried ripe seeds of Delphinium Staphisagria.

Habitat.—South of Europe.

Magnoliaceæ.

Characters.—The seeds are of an irregular triangular or obscurely quadrangular shape, and possess a deeply wrinkled and pitted testa.

Composition.—The seeds contain from 25 to 28 per cent. of fatty oil. The testa contains delphinine, delphinoidine and staphisaine.

Therapeutics.—Its principal use is externally in the form of an ointment for destroying pediculi.

Official Preparation.—Unguentum Staphisagriæ.

No. 7. Cimicifugæ Rhizoma. *Actæa Rhizome.*

The dried rhizome and rootlets of Cimicifuga racemosa, or black snake root. contains [illegible]

Habitat.—United States of North America.

Characters.—The rootlets are considered to be the most active portions; they resemble the rootlets of Actæa spicata in possessing a stellate meditullium.

Composition.—Cimicifuga contains a resin named cimicifugin or macrotin, from 3 to 4 per cent.; and a volatile oil, and tannin.

Therapeutics.—Nervine tonic and sedative.

Official Preparations.—Ext. Cimicifugæ Liq.; Tinct. Cimicifugæ.

MAGNOLIACEÆ.

No. 8. Anisi Stellati Fructus. *Star Anise Fruit.*

The dried fruit of Illicium verum anisatum. From plants cultivated in China (Annam).

Characters.—The Star Anise fruit, as found in commerce, consists of eight carpels arranged in a stellate manner. Each carpel is generally found with an opening which is its ventral suture, by which it has dehisced, and within each carpel is found a single seed.

on adding [illegible]
if it does, shows presence of alcohol.

Composition.—The oil contains 75 per cent. of Anisol or Anise Camphor, and a Neutral Hydro-carbon. The fruit yields from 4 to 5 per cent. of volatile oil; the seeds yield about 25 per cent. of a bland fatty oil.

The essential oil obtained from the Pimpinella Anisum may be distinguished from that obtained from the Illicium anisatum by congealing at temperatures between 50° and 60° F., while that obtained from star anise congeals at about 35° F.

Therapeutics.—Used as an aromatic and carminative.

Official Preparation.—Oleum Anisi.

Illicium Religiosum (poisonous)

No. 9. Winteri Cortex. *Winter's Bark.*

(Not official.)

The bark of Drimys Winteri, or Drimys aromatica.

Habitat.—The coasts of the Straits of Magellan. Most of the Winter's Bark, if not all, found in commerce, is obtained from Cinnamodendron corticosum, a plant of the Natural Order Canellaceæ.

Adulteration.—Canella Alba Bark is often substituted by mistake for Winter's Bark. Canella Bark has its inner surface very white; Winter's Bark is thicker, and its inner surface is less white. An infusion of Winter's Bark will also strike a black colour with salts of iron, due to the tannic acid contained in it; an infusion of Canella Bark will not, since it contains no tannic acid.

Composition.—True Winter's Bark contains a little tannic acid, volatile oil, and resin. Its decoction is not coloured purplish-brown by iodine like that of Cinnamodendron.

Therapeutics.—Used as an aromatic and tonic.

MENISPERMACEÆ.

No. 10. Calumbæ Radix. *Calumba Root.*

The dried transversely cut slices of the root of Jateorhiza Calumba (Cocculus palmatus).

Menispermaceæ.

Habitat.—The forests of Eastern Africa, between the rivers Ibo and Zambesi.

Characters.—Calumba root consists of the sliced and dried fleshy portions of the root. A test used by the natives as to the quality of the root is to expose it to the sun; if it then possesses a brittle fracture it is good, but if soft it is regarded as of bad quality. The interior of each slice is depressed, due to shrinking during the process of drying.

The yellow colour of the root is due to the salts of berberine contained in it. It is frequently found perforated with holes, caused by insects, on account of the starch which it largely contains. The small slices are the best, as they possess the most cortical portion in which the greatest amount of activity resides.

Adulterations.—Bryony Root from Bryonia dioica, the root of Frasera Walteri, and the stem of Coscinium fenestratum (a menispermaceous plant), have been substituted for Calumba Root. They are distinguished from Calumba by their slices having no depression, and the last two by not giving a blue colour when touched with tincture of iodine, on account of the absence of starch.

Composition.—A neutral crystallisable principle, Calumbin, the alkaloid berberine combined with calumbic acid and about 33 per cent. of starch. Calumbate of berberine is soluble both in water and spirit, it is therefore contained in the infusion and tincture; the alkaloid berberine was first discovered in the Berberis vulgaris (*common barberry*). A cold decoction of Calumba Root gives a dark blue colour with tincture of iodine, on account of the starch contained in it.

Therapeutics.—Calumba Root is useful as a stomachic and tonic.

Dose.—10 to 20 grains.

Official Preparations.—Ext. Calumbæ; Inf. Calumbæ; Tinct. Calumbæ; Mist. Ferri Aromat.

Menispermaceæ.

No. 11. **Pareiræ Radix.** *Pareira Root.*

The dried Root of Chondrodendron tomentosum.* It is commonly called *Pereira Brava.*

Habitat.—Brazil.

Characters.—In long, nearly cylindrical, more or less twisted pieces, from about three-quarters of an inch to two or more inches thick; covered with a thin, blackish-brown bark, and marked externally with longitudinal furrows and transverse ridges and fissures. Internally yellowish or brownish-grey, with well-marked concentric or more or less eccentric circles of porous wood, separated into wedge-shaped portions by large medullary rays, and when cut presents a waxy appearance. It has no odour, but a bitter taste. Its decoction, when cold, is turned inky bluish-black by solution of iodine.

Composition.—Fluckiger has shown in his analysis of this drug that it contains the alkaloid Pelosine or Cissampeline, chemically identical with Berberine and Buxine.

Adulterations.—Previous to the discovery of the true source of pareira root, the roots of some allied species were almost entirely found in commerce; all that is known about them is, that they were derived from some menispermaceous plants of unknown origin; that they belong to the Menispermaceæ is evident from the peculiar structure of their wood. The true pareira root may be distinguished from the adulterations by the following characters:—

The true root is darker in colour externally; it generally possesses only three or four concentric rings of wood, arranged in a very irregular manner, and has a smooth waxy cut.

The substituted root generally possesses a number of concentric rings arranged in a regular manner, and when cut it presents a rough surface, due to the cells not being in such a compact condition as in the true root.

The stems of the Chondrodendron tomentosum, and of allied species, have been substituted for the official root.

* Cou [illegible]

Menispermaceæ.

The root may be distinguished from the stem as follows :— The root is darker and more irregular than the stem; it generally has short rootlets, but it has no perceptible pith, nor any development of lichens.

The stem has a pith and an evident development of lichens.

Therapeutics.—Pareira root is a tonic and diuretic.

Official Preparations.—~~Decoct. Pareiræ~~; ~~Ext. Pareiræ~~; Ext. Pareiræ Liq.

No. 12. Cocculus. *Cocculus Indicus, or Levant Nut.*

(Not official.)

The dried fruit of Anamirta Cocculus or Anamirta paniculata. It is commonly but incorrectly called a berry; it is a drupe.

Habitat.—India.

Characters.—The Cocculus Indicus fruit is reniform or kidney shaped, enclosing one seed, which is firmly attached by the placenta to the pericarp. If the fruit is good, this seed should fill at least two-thirds of the shell.

Cocculus Indicus fruits are frequently confounded with Bay Berries. They may be distinguished as follows :—

Cocculus Indicus.	**Bay Berries.**
1. Kidney shaped.	1. Oval in shape, larger than Cocculus Indicus.
2. The seed does not rattle when the fruit is shaken, being firmly attached to the placenta.	2. The seed rattles when a berry is shaken, because it lies loose in the pericarp.

Composition.—It contains a crystalline neutral principle, Picrotoxin, found only in the seed, to which its activity is due. The pericarp contains two alkaloids, menispermine and paramenispermine, both of the same composition.

Therapeutics.—Cocculus Indicus has been used externally in the form of an ointment, to destroy vermin. It is frequently used to adulterate beer, in order to increase its intoxicating power. It is also used by poachers for stupefying fish and game.

PAPAVERACEÆ.

No. 13. Rhœados Petala. *Red Poppy Petals.*

The fresh petals of Papaver Rhœas, the red or corn poppy.

The fresh petals only should be used in making the syrup; and they should be collected on a hot dry day.

Habitat.—Indigenous.

Composition.—Red poppy petals contain two red colouring matters, composed of (Rhœdic and Papaveric acids,) which are amorphous. They contain no morphine. ([illegible])

Official Preparation.—Syrupus Rhœados. colouring matter.

No. 14. Papaveris Capsulæ. *Poppy Capsules.*

The nearly ripe dried capsules of Papaver somniferum, the opium poppy.

Habitat.—From plants cultivated in Britain.

Characters.—There are three well-marked varieties of the Papaver somniferum, *viz*:—

1	2	3
Papaver somniferum—*var.* glabrum.	**Papaver somniferum—*var.* album.**	**Papaver somniferum—*var.* setigerum.**
Petals usually red. Capsule dehiscing by pores, situated under the stigma, seeds dark coloured. These seeds are commonly called *maw seeds.* Stigmas, 10 to 12.	Petals white. Capsule indehiscent, more or less egg-shaped. Seeds white.	Petals particoloured. Leaves, peduncles, and calyx covered with stiff hairs. Stigmas, 7 to 8.

Poppy capsules are most active before they are quite ripe, and should be gathered at that period. The top of each capsule is crowned by stellately arranged stigmas. Within,

[illegible] Seen [illegible]

Papaveraceæ.

the seeds are attached to parietal placentas, which project into the cavity of the ovary, and which are equal in number to the stigmas.

The capsule contains a very large number of loose, small, reniform, whitish, slate-coloured, or nearly black seeds, known as maw seeds.

Composition.—A small amount of the principles found in opium.

Official Preparations.—Decoct. Papaveris; Ext. Papaveris; Syr. Papaveris.

No. 15. Opium. *Opium.*

The juice obtained by incision from the unripe capsules of Papaver somniferum, and hardened by spontaneous evaporation.

Habitat.—Asia Minor; cultivated also in Egypt, Persia, India, and China.

Collection.—Opium is obtained by making incisions into the poppy capsules a few days after the petals have fallen; the incisions are made either horizontally, spirally, or vertically, so as to cut the lactiferous vessels in which the juice is contained, and which permeate in every direction. In Asia Minor and Smyrna the incisions are made horizontally, and extend about three-fourths round the capsule. In India the incisions are made vertically. Care must be taken that the incision does not go through the pericarp, as this would cause most of the milky juice to flow into the inside and to be lost, and would also prevent the ripening of the seeds, which alone will pay the cost of the cultivation of the poppy, on account of the oil obtained from them. The exuded juice, which is at first of a white colour, soon becomes brown and concretes in the form of tears, which are then scraped off and either worked up into a mass, or the separate tears are simply put together. The opium is further dried in the shade, and the masses are usually enveloped in leaves.

Papaveraceæ.

No. 16. Smyrna Opium, commonly called Turkey or Levant opium, occurs in masses, made up of agglutinated tears, weighing from half to two pounds. These masses are wrapped up in poppy leaves, which possess a stout mid-rib and pinnate venation, and are generally covered externally by the capsules of a species of *Rumex:* instead of the capsules their triangular fruits are frequently found on the masses of opium, on account of their calyces having been rubbed or shaken of. 10'5 % [illegible]

No. 17. Constantinople Opium occurs either in large cakes or in small lenticular masses, weighing from a quarter to half a pound. The masses are generally wrapped in a poppy leaf, with the mid-rib generally placed across the middle of the cake, by which character this kind of opium may be distinguished from Smyrna opium. Constantinople opium is generally considered to be inferior to Smyrna; some specimens, however, contain a large percentage of morphine.

No. 18. Egyptian Opium occurs in circular cakes, more or less flat, about two or three inches in diameter, and covered with a leaf which is believed to be that of the Oriental Plane. This leaf can be distinguished from the poppy leaf by possessing palmate or radiate venation. Internally this opium is of a reddish colour, and does not darken by keeping, as the other kinds of opium do. It is inferior to either the Smyrna or Constantinople opium.

No. 19. Persian or Trebizond Opium comes over but rarely, in sticks wrapped up in paper, about the thickness of the little finger and about six inches in length. This opium is very inferior. Recently opium of a better quality has been imported from Persia in lumps, some specimens of which, forwarded to the author, contain from 12 to 15 per cent. of morphine.

East Indian Opium. *Malwa Opium* occurs very rarely in English commerce. It is met with in the form of hard, circular, flattened cakes, not wrapped in any leaf.

Papaveraceæ.

Adulterations.—Inferior kinds of opium, and opium from which the morphine has been extracted, have been substituted for good opium. Impurities, such as stones, gravel, bullets, &c., have frequently been found mixed with opium. Opium of too soft a consistence should not be used, as the more water there is in a sample the smaller the percentage of morphine will be.

The best way to ascertain the purity of a sample of opium is to estimate the amount of morphine present in it. For a description of the process see British Pharmacopœia.

Composition.—*Morphina.*—This is the most important of the numerous alkaloids found in opium, the commercial value of which entirely depends upon the percentage of morphine it contains. All samples of opium contain morphine, but in varying amounts, the highest recorded percentage being 23. The opiums most sought after for the preparation of this alkaloid are Asia Minor and Persian. The latter, prior to extraction of its morphine, is thoroughly percolated with petroleum ether, to remove the fatty oil added during its manufacture.

Codeina.—This alkaloid, which has been isolated from various samples of opium, differs from morphina by its much greater solubility in hot water. Codeine usually occurs in large transparent hard crystals, containing 5½ per cent. of water of crystallisation. Some samples of opium yield only minute quantities of this alkaloid; but occasionally as much as ·4 to ·5 per cent. has been obtained.

Apocodeina.—When codeine is heated in a hermetically sealed tube with chloride of zinc it loses a molecule of water, and is converted into apocodeine.

Narcotina.—This substance is found in most samples of opium, but in very varying amounts. Some varieties of Persian opium have yielded as much as 10 per cent.; but it is only found in small amount in Smyrna opium. Narcotine may be extracted from opium by percolation with ether, which removes wax and fatty matter as well. The ether is evaporated off, the glutinous residue exhausted

Papaveraceæ.

with acetic acid, filtered, and slowly evaporated, when the narcotine crystallises out as acetate; which, on addition of hot water, decomposes into free acetic acid, and narcotine, which is precipitated.

Narceina occurs in very small quantities in opium, varying from ·02 to ·71 per cent.

Thebaina, or Paramorphina.—This principle has been isolated from Smyrna opium by Merck, who obtained 1 per cent.

Accompanying these active principles are a large number of lesser importance, among them being Meconin, Cryptopine, Laudanine, Papaverine, and Rhœadine.

Meconic Acid.—This acid is the natural acid found in opium. It is precipitated from its solution on the addition of plumbic acetate, or calcic chloride. On suspending the plumbic meconate in water and decomposing with a current of sulphuretted hydrogen gas, the free meconic acid remains in solution, which, on evaporating by the aid of a water bath to a small bulk, crystallises out in pearly scales. Its solution gives a blood-red colour with neutral ferric chloride

Lactic Acid is found in opium, and is supposed to be a product of the fermentation which takes place on drying the masses.

Therapeutics.—Opium, when taken internally, generally produces at first a stimulating effect on the vascular and nervous systems, afterwards producing sleep. In large doses it is a poison, the sleep passing into a condition of coma, followed by death.

Dose $\frac{1}{2}$-grain to 3 grains.

No. 19a. **Sanguinaria.** *Bloodroot.*

The dried rhizome of Sanguinaria canadensis.

Habitat.—Indigenous to Canada and the Northern States of America.

Characters.—The rhizome varies from three to four inches

Also [illegible]

long and about half an inch thick, cylindrical, branching occasionally, and its upper surface marked with the annulations of the leaves; externally it is of a light brown colour, red internally; odour heavy, and taste bitter and acrid.

Composition.—It contains sanguinarine, porphyroxine, resin, citric and malic acids. The resin, which is of a red colour, consists of two resins, which yield when fused with caustic soda, protocatechnic acid.

CRUCIFERÆ.

No. 20. Sinapis Nigræ Semina. *Black Mustard Seeds.*

The dry ripe seeds of Brassica nigra. (Sinapis nigra.)

Habitat.—Indigenous; growing in waste places, and cultivated in fields.

Characters.—Black mustard seeds are very small, scarcely half the size of white mustard seeds, roundish, dark reddish, or greyish brown, finely pitted, hard; internally yellow. They possess no odour when dry, but when triturated with water they exhale a strong pungent odour, due to the formation of volatile oil.

Large quantities of mustard seeds are produced in the Netherlands, whilst Yorkshire and Lincolnshire are the principal counties where they are grown in England.

Composition.—About 25 per cent. of a fixed fatty oil, myrosin, sinigrin, and mucilaginous matter.

Essential Oil of Mustard (Allyl Thiocarbimide) may be obtained by careful distillation, after fermentation has taken place. It is a pale yellow oil, with intensely irritating vapour and strong vesicating properties.

Essential Oil of Mustard may be prepared artificially by the action of syrupy phosphoric acid on sulphurea, or by the action of ammonium sulphocyanate on allyl iodide.

No. 21. Sinapis Albæ Semina. *White Mustard Seeds.*

The dried ripe seeds of Brassica alba. (Sinapis alba.)

Sinapis contains starch when not properly ripe.

[illegible] Sinapis = nigra = 2/6
alba 3 ~

Cruciferæ.

Habitat.—Indigenous.

White mustard seeds are larger than those of the black mustard. They are of a yellow colour, both externally and internally. They possess a pungent taste, but no odour, even when rubbed with water. Flour of mustard consists of the seeds of both black and white mustard crushed, pounded, and afterwards sifted.

The two plants may be distinguished by the following characters: White mustard has hispid spreading siliques, which are short, and are surmounted by a long, compressed veined beak. Black mustard has smooth siliques, adpressed to the stem, with a short straight beak.

Composition.—White mustard seeds principally differ from the black in not yielding any essential oil, and in containing less sulphur. They contain about 25 per cent. of a fatty oil, Sinalbin and Myrosin: these, in contact with water, yield a fixed pungent body called sulphocyanate of acrinyl.

Commercial powdered mustard varies considerably in its value; some samples containing added starch and turmeric. It contains, in varying proportions, both black and white mustards.

The seeds are sometimes adulterated with rape-seeds, which can be detected by chewing; they have a bland, oily taste, but no acridity.

Therapeutics.—Mustard acts as a powerful stimulant, diuretic, and in large doses it possesses emetic properties.

Official Preparations.—Of the powder, ~~Cataplasma Sinapis~~ and Charta Sinapis; of the Black Mustard Seeds, Oleum Sinapis; of the Oil, Linimentum Sinapis Co.

No. 22. Armoraciæ Radix. *Horseradish Root.*

The fresh root of Cochlearia Armoracia.

Habitat.—Cultivated in Britain and all parts of Europe.

Characters.—Horseradish root is long, cylindrical, of a very light yellow colour externally, and of a white colour within. When cut or scraped it emits a very pungent

all [illegible]

odour. It is most active in autumn, and in early spring, before the leaves have appeared.

Composition.—The chemical constituents of this root are but imperfectly known. When the root is rasped into fine shavings and submitted to distillation with water, a pungent volatile oil distils over, and the aqueous residuum, on addition of strong alcohol, throws down a flocculent precipitate, probably myrosin. The essential oil which is obtained on distillation does not pre-exist in the root, as can be proved by treatment with ether, when no oil is dissolved out, but only a small amount of fatty matter. Chemically, the oil is identical with that described under black mustard, the root yielding about ·008 per cent.

Therapeutics.—The same as mustard.

Official Preparation.—Sp. Armoraciæ Co.

POLYGALACEÆ. [illegible]

No. 23. Senegæ Radix. *Senega Root.*

The dried root of Polygala Senega.

Habitat.—British North America and United States.

Characters.—Senega root consists of twisted portions, about the thickness of a quill, attached to a knotty root stock. Each portion has a projecting ridge in the form of a keel, extending throughout its entire length. The activity resides in the cortical portion, the meditullium or inner portion being practically inert.

The formation of the keel-shaped ridge, resembling a contorted sinew, is due to the unequal development of the liber tissue.

Composition.—Senegin or Polygalic Acid, Malic Acid, Virgineic Acid and Resin, with small amount of a volatile oil.

Adulterations.—Occasionally other roots have been found admixed with senega, but their occurrence is to be ascribed to carelessness during collection. The more commonly

Polygalaceæ.

occurring roots are those of Panax quinquefolium and the rhizome of Cypripedium pubescens. Neither of them can be mistaken for senega. The former is much larger and spindle shaped, with numerous transverse ridges, and the latter darker in colour, and slightly notched; in both there is an absence of the characteristic ridge found on senega.

One of the more modern adulterations is that of the root of Ionidium Ipecacuanha. It occurs as an undulated root, markedly wrinkled with deep transverse cracks, exposing a yellowish meditullium; externally it has a grey colour. The rhizome of Asclepias Vincetoxicum has also been found. It may be distinguished by its yellow centre and evident pith, by the scars of the stems, and the very slight taste.

Therapeutics.—Senega root possesses diaphoretic, diuretic, and expectorant properties.

Official Preparations.—Inf. Senegæ; Tinct. Senegæ.

No. 24.—Krameriæ Radix. *Rhatany Root.*

3 [illegible]

The dried root of Krameria triandra (Peruvian Rhatany) and Krameria ~~Ixina~~ argentina (Savanilla Rhatany).

Aust

20%

Habitat.—The eastern coasts of South America.

Characters.—Peruvian Rhatany is in branched or unbranched pieces, varying in length and thickness. It consists of a readily separable bark, which varies in thickness from one-twentieth to one-tenth of an inch, rough and scaly, except in the smaller pieces, dark reddish-brown externally, and bright brownish-red on its inner surface; and of a hard brownish or reddish yellow woody axis.

Savanilla Rhatany is less irregular and knotty, and not so long or thick as Peruvian. It is well characterized by its pale purple colour, and its smooth and thicker bark, which adheres firmly to the wood beneath, and is usually marked at irregular intervals by deep transverse cracks. The bark of both kinds has a strongly astringent taste; and when chewed tinges the saliva red, but it has no marked odour. The wood is nearly tasteless and inodorous.

The root of Krameria Ixina may be distinguished from that of Krameria triandra by the fact that the bark adheres closely, is transversely cracked, and has not a fibrous character.

Composition.—Rhatania-tannic Acid, Rhatania Red, gum and sugar.

Therapeutics.—A powerful astringent.

Official Preparations.—Ext. Krameriæ; Inf. Krameriæ; Pulv. Catechu Co.; Tinct. Krameriæ.

LINACEÆ.

No. 25. Lina Semina. *Linseed.*

most useful

The dried ripe seeds of Linum usitatissimum, *or common flax.*

Habitat.—Probably a native of Southern Europe, but is cultivated in most countries.

The fruit is an ovate or globular capsule composed of five carpels, and is five-celled, each cell containing two seeds.

The seeds are principally imported from the Russian ports and Germany, also from Holland, the south of Europe, and India. They are inodorous, and have a mucilaginous and slightly bitter taste.

Composition.—Fixed oil and mucilage.

Fixed oil.—This oil is prepared on a large scale, and two processes are adopted. First:—The oil is expressed from the seeds in their natural condition. Second:—The seeds are heated previously to expression. The oil obtained by cold pressure is much lighter in colour, being of a very pale yellow, neutral to litmus, and devoid of an acrid taste, but as generally found the oil is of a brownish colour, much thicker, with a disagreeable odour and pungent taste. The yield of oil by cold pressure is about 25 per cent., but when heat is employed as much as 35 to 40 per cent. is obtained.

Malvaceæ.

Mucilage.—This body is easily extracted by treating the seeds with warm water.

Linseed Meal (now official) contains variable proportions of oil, as the oil slowly resinifies on exposure to air.

Flax is prepared from the liber or inner bark of this plant.

Tow consists of the short threads separated during the combing of flax.

Linen is made from flax, and *lint* is linen the surface of which has been scraped.

Therapeutics.—An emollient and demulcent.

Official Preparations.—Farina Lini; Inf. Lini; Ol. Lini.

MALVACEÆ.

No. 26. Gossypium. *Cotton Wool.*

The hairs of the seeds of Gossypium barbadense and other species of Gossypium, from which fatty matter and all foreign impurities have been removed.

Habitat.—Egypt, India, and cultivated in America.

Characters.—Cotton wool consists of the fine hairs found firmly adherent to the testa of the seed, from which they are removed by machinery, and then carded; a little oil being added during the latter part of the process. Microscopically examined, the hairs are found to consist of simple cells, with thin walls, and appear as twisted, hollow bands, thickened at the edges.

Composition.—Cotton wool is nearly pure cellulose. Nitric Acid converts it finally into oxalic acid, but first forms nitro compounds, and probably mucic acid. Strong sulphuric acid dissolves it. Boiled with dilute sulphuric acid it yields glucose. Nitro-sulphuric acid forms nitro substitution compounds, in which one or more hydrogen atoms are replaced by nitryl.

No. 1. Trinitro-cellulose. Insoluble in ether and alcohol, but soluble in ethyl acetate.

No. 2. Dinitro-cellulose. Insoluble in glacial acetic acid, but soluble in ether and alcohol.

No. 3. Mononitro-cellulose. Soluble in glacial acetic acid.

The first is the most explosive, and is the one used in blasting operations, as gun cotton.

Official Preparation.—Pyroxylin.

STERCULIACEÆ or BYTTNERIACEÆ.

No. 27. Theobromæ Semina. *Cacao, Cacao Nibs.*

The crushed and roasted seeds of the Theobroma Cacao. A tree growing to a height of 30 to 40 feet.

Habitat.—Tropical South America and Mexico.

Characters.—The seeds are contained in a large fruit, about 6 to 9 inches long, which is five-celled, and has a thick, tough rind, and in the ripe condition is of a reddish yellow colour. The seeds range from ½ to 1 inch in length, are generally oblong or ovate, and of a brownish red colour, and are anatropous. The testa is papery and easily removed. Taste aromatic, oily, and slightly bitter.

Chemical Composition.—Fatty oil, 38 to 52 per cent.; Theobromine, 1·2 to 4·8 per cent.; Cacao-Red; volatile oil; and starch.

Uses.—Dietetic purposes.

No. 28. Oleum Theobromatis. *Oil of Theobroma.*

Cacao Butter.

Characters.—Of the consistency of tallow, colour yellowish; odour resembling that of chocolate; taste bland and agreeable; fracture clean, presenting no appearance of foreign matter. Does not become rancid from exposure to the air. It usually melts at temperatures between 86° and 95° F. Sp. gr. ·948 to ·980.

Preparation.—In the preparation of cocoa or chocolate, a portion, or in some cases nearly the whole, of the fatty

Sapindaceae

Camelliaceæ.

oil is removed by hot pressure. The crushed seeds are passed between hot iron or steel rollers, and the liquid oil is collected in a vessel; it is then re-melted, strained, poured into moulds, and allowed to solidify. By this process only a portion of the oil is obtained, the usual average in operating on large quantities being from 40 to 45 per cent.

Official Preparations.—Suppositoria Acidi Tannici, Hydrargyri, Iodoformi, Morphinæ, and Plumbi Co.

SAPINDACEÆ.

No. 29. Guarana. *Brazilian Cocoa.*

The seeds of Paullinia sorbilis, ground and made into a paste with water, and then moulded into cylindrical masses, and dried by exposure to the sun, or by artificial heat.

Habitat.—Found in the west and north of Brazil. Q. A.

Characters.—Generally occurs in long cylindrical masses, sometimes in round cakes, with a rough surface, and dark, reddish brown colour. When cut it presents a shining surface, and yields a light powder on grinding. An infusion has a chocolate-like odour and taste, but is somewhat bitter and astringent.

Chemical Composition.—Tannin, guaranine or caffeine, starch, and a coloured fat.

The Caffeine varies in percentage from 3·2 to 5.

Therapeutics.—Given in facial neuralgia, combined with quinine sulphate, and for sick headache.

CAMELLIACEÆ or TERNSTRŒMIACEÆ.

No. 30. Thea. *Tea.*

The dried and prepared leaves of Camellia Thea and its cultivated varieties.

Habitat.—China, India, and Ceylon.

Preparation.—The leaves are carefully collected, and according to the variety of tea that is to be prepared, are submitted to different methods of drying. *Green Teas.*—The leaves are slightly heated, when they acquire this peculiar colour, and are then rolled separately in small heaps and quickly dried. *Black Teas.*—In this case the leaves, after collection, are exposed for some time, and made into heaps to ferment, after which they are exposed to a small fire, rolled on tables, and dried. Various methods are resorted to in flavouring and colouring teas.

Characters.—Commercially, teas are more or less broken and twisted; but for examination it is preferable to macerate them in water for some time, and then carefully unfold them. They vary in length from 1 to 3 inches, tapering to a fine point at both ends, and are irregularly toothed at the margins, and short stalked.

Chemical Composition.—Tannic Acid, Boheic Acid, and Theine or Caffeine.

The leaves when incinerated leave from 4 to 6 per cent. of ash, of which nearly one-half is soluble in water.

Preparation.—Caffeina.

AURANTIACEÆ.

No. 31. Aurantii Amari Cortex. *Bitter Orange Peel.*

The dried outer part of the rind or pericarp of Citru vulgaris (Citrus Bigaradia).

Habitat.—A native of Northern India; the varieties are largely cultivated in Spain, France, Algeria, Malta, Jaffa, Mexico, Florida, and the West Indian Islands.

Characters.—Orange peel is best prepared by hand-cutting, and as much as possible of the white spongy parenchyma removed, and carefully dried. It usually occurs in narrow strips or curled bands, rough, glandular, and of a dark orange red colour, white within, the outer portion having a large number of oil cells. It has an aromatic, agreeable odour, and bitter taste. There are two varieties of dried orange peel to be found in commerce: home hand-cut peel and Maltese peel. The former is the better, and

Aurantiaceæ.

alone should be used in pharmacopœial preparations. The Maltese peel is cut very thin, and very frequently torrified to darken its colour; occasionally charred pieces are found resulting from overheating. It is much less aromatic, and has a feebly bitter taste, compared with the hand-cut peel.

$C_{10}H_{16}$ *Chemical Composition.*—Essential Oil, Hesperidin, Gum, Resin, and Calcium Salts of organic acids.

Therapeutics.—Stomachic and tonic.

Official Preparations.—Inf. Aurantii; Inf. Aurantii Co.; Inf. Gentianæ Co.; Tinct. Aurantii; Tinct. Aurantii Recentis; Tinct. Gentianæ Co.; Tinct. Cinchonæ Co.; Sp. Armoraciæ Co.; Syr. Aurantii Floris; and Vin. Aurantii.

No. 32. Limonis Cortex. *Lemon Peel.* Rutaceae

The outer part of the rind or pericarp of the fresh fruit of Citrus ~~Limonum~~ Aurantii.

Habitat.—A native of Northern India, cultivated on the shores of the Mediterranean.

Characters.—Pale-yellow and more or less rough on the outer surface, from the presence of glands containing volatile oil, which are embedded in the tissue beneath; and having but a very small amount of the white spongy portion of the rind on its inner surface. Odour strong, peculiar, and fragrant; taste warm, aromatic, and bitter.

Prepared in the same manner as Orange Peel.

Chemical Composition.—Hesperidin, Essential Oil, Gum. $C_{10}H_{16}$

$C_{11}H_{16}$ *Preparation.*—Essential Oil of Lemon, Essence of Lemon. There are two methods employed in preparing this important oil: 1st. The sponge process.—The operator removes the peel from the unripe fruit in three slices, leaving most of the pulp; then, having collected a sufficiency of peel, he places a sponge in the palm of his left hand; wrapping it round his forefinger, he places on the sponge one of the slices of peel, the outer surface next the sponge, and exerts a strong pressure by which the oil cells are burst and discharge their contents on the sponge; this is afterwards wrung into an earthen vessel, and the oil which separates from the juice is collected and filtered. 2nd. The Ecuelle process.—The operator has a shallow vessel having fixed on its bottom a number of sharp points about half an inch in length, the centre of the bottom being depressed into a tube about 6 inches long, and closed at one end by a stopper: such a vessel is called an "*Ecuelle à piquer.*" This vessel is fixed on a stand, and the operator draws the lemon over the sharp points, exercising at the same time a little pressure; the oil, as it exudes, runs into the tube, and is afterwards removed, separated from watery liquid, and filtered. This mode of extracting essential oils from fruits is now carried on to a large extent; such oils are named Ecuelled Oils.

The residual peel from both processes is afterwards distilled with water, by which an inferior oil is obtained, which is frequently used to dilute the superior oils.

Oil of Lemon has a pale yellow colour, is fragrant and aromatic, and has a bitterish taste; it is readily soluble in carbon bisulphide, sparingly in alcohol ·838. On keeping it becomes muddy, and acquires a terebinthinate odour. Sp. gr. ·836 to ·860.

Adulteration.—This oil is frequently submitted to sophistication, either with rectified turpentine (Camphene) or the oil distilled from the residual peel; they are most difficult of detection.

No. 33. **Belæ Fructus.** *Bael Fruit.*

The dried half-ripe fruit of Ægle Marmelos, the Indian Bael or Bengal Quince.

Habitat.—Malabar and Coromandel; but cultivated to a considerable extent throughout India and Ceylon.

Characters.—Fruit roundish, about the size of a large orange, with a hard, woody, nearly smooth rind; usually imported in dried slices, more or less twisted, or in fragments consisting of portions of the rind and adherent dried pulp and seeds. Rind about one-eighth of an inch thick, hard, and covered with a nearly smooth pale brown or greyish firmly adherent epicarp; the pulp firm and brittle, and of an orange-brown or cherry-red colour externally, but when broken it is seen to be nearly colourless internally. It has no odour, and its taste is simply mucilaginous, and very slightly acid.

Chemical Composition.—No satisfactory analysis of Bael fruit has been made. The rind contains much mucilaginous and pectinose matter, and in the unripe condition is said not to contain any tannin. Collas states that the ripe fruit contains 5 per cent. of tannin; but this is doubtful. The infusion is scarcely affected by iron salts.

Substitutes.—The fruit of the Mangosteen (Garcinia Mangostana), a native of Malacca, is also largely eaten in India, as well as the fruits of other species of Garcinia. The Mangosteen has a softer rind, and is of a darker colour; at its apex there are five sessile radiating stigmas which easily distinguish it.

The rind of the Pomegranate is sometimes met with; it is readily distinguished by being much thinner, of a darker colour externally, and a peculiar greenish yellow colour internally, and when rubbed on a piece of white paper moistened with water, will leave a yellow stain.

Therapeutics.—Used in diarrhœa and dysentery.

Official Preparation.—Ext. Belæ Liquidum.

CANELLACEÆ.

No. 34. Canellæ Cortex. *White Wood* or *Wild Cinnamon.*

The bark of Canella alba (Winterania Canella) deprived of its suberous layer and dried.

Habitat.—Bahama Islands (from which it is imported), Florida, and West Indian Islands.

Characters.—In quills or irregular pieces which are generally more or less twisted and broken longitudinally; it has a pale orange-brown or buff colour externally, is commonly marked by roundish depressions or scars, and sometimes the remains of the corky layer may be seen here and there as silvery grey patches; internally its colour is paler, being whitish or yellowish white. It has an agreeable odour, somewhat resembling a mixture of cloves and cinnamon, and a pungent, bitter, acrid taste.

The quills vary in length from 1 to 3 feet, with bright reddish markings of resin cells.

Preparation.—Prior to removing the bark from the tree, it is gently beaten, after which the suberous layer falls off and the inner bark is removed; it is then exposed in trays and dried by the sun's heat.

Chemical Composition.—The bark contains a bitter principle which has not yet been isolated in a pure condition, resin, mucilage, and a volatile oil.

Substitute.—The bark of another canellaceous tree has been used, namely, Cinnamodendron corticosum; this bark is much darker in colour and not white on its inner surface. It contains a small amount of tannin, but agrees in its aromatic properties. Both barks have occasionally been used for Winter's Bark, and the bark which is now found in commerce under that name is mainly derived from Cinnamodendron corticosum.

Therapeutics.—An aromatic tonic.

Official Preparation.—Vinum Rhei.

The powder called Hiera Picra consists of powdered aloes and Canella bark.

GUTTIFERÆ.

No. 35. Cambogia. *Gamboge.*

A gum-resin obtained from Garcinia Hanburii (Garcinia Morella, var. pedicellata).

Habitat.—Siam, Cochin China, Southern India, and Ceylon.

Characters.—In cylindrical, solid, or hollow rolls, longitudinally striated on the surface, and either distinct or

Guttiferæ.

more or less agglutinated or folded together into masses; breaking with a conchoidal fracture, the fractured surface being opaque, smooth, glistening, and of a uniform reddish-yellow colour; powder, bright yellow; no odour; taste, very acrid. When rubbed with water it forms a yellow emulsion; it is completely dissolved by the successive action of rectified spirit and water; and an emulsion made with boiling water and cooled does not become green on addition of solution of iodine.

Collection.—A spiral incision is made into the trunk of the tree, and a bamboo cane inserted at the end, when the latex gradually flows for a considerable length of time. After this the canes are allowed to hang for some time, when the yellow juice gradually hardens, and is then removed, having longitudinal furrows caused by the ridges inside the bamboo.

Cake or Lump Gamboge is that portion of the latex which exudes from the broken twigs and leaves, and generally is of a coarser quality, being mixed with rice-flour, earth, and powdered bark. The latex is principally secreted in the numerous ducts of the mesophlœum, and in the dotted vessels of the young wood, flowers, fruit, and leaves.

50 to 80% 16%

Chemical Composition.—Resin, Gum, and about 5 per cent. of moisture.

The *Resin* is named Cambogic Acid. In a sample of pipe gamboge lately examined, 78 per cent. of this body, which is readily soluble in ether, alcohol, and chloroform, was obtained.

Gum.—The residue, after percolation with ether alcohol, yielded 18 per cent. of gum to warm water, and was found to differ from gum arabic by being miscible with neutral plumbic acetate solution and a solution of borax.

Adulteration.—Pipe Gamboge is rarely submitted to adulteration, but cake or lump gamboge is mixed with all manner of substances, the principal being ground rice.

Tests.—Good Gamboge should be imperfectly soluble in a mixture of ether and alcohol, and the insoluble residue left should be readily soluble in water; if any insoluble portion remains, boil it with water and allow it to cool, then add a drop or two of a solution of iodine in potassium iodide; if a dark blue colour is produced it indicates starch.

Therapeutics.—A drastic purgative; in large doses it is poisonous.

Official Preparation.—Pil. Cambogiæ Co.

ERYTHROXYLACEÆ. or Linacea

No. 36. Coca Folia. *Coca Leaves. Coca or Ipadu.*

Synonym :—Cuca.

The dried leaves of Erythroxylon Coca.

The Coca plant is a small shrub, with numerous reddish-brown branches: with small yellowish white flowers, and a brilliant scarlet drupaceous fruit. Growing at an altitude of 6000 feet.

Habitat.—Indigenous to Bolivia and Peru, on the eastern slopes of the Andes.

Characters.—Shortly stalked, oval or lanceolate, of varying thickness, one to two inches or more in length, entire, usually blunt, and emarginate, quite smooth; midrib prominent, with numerous faint freely anastomosing lateral veins, and on each side of the midrib a curved line extends from base to apex; green above, somewhat paler beneath. In commercial specimens the leaves are more or less broken, and frequently yellowish-green, yellowish-brown, or brown. and in rare cases the curved lines are indistinguishable. Odour faintly tea-like, especially when bruised; taste somewhat bitter and aromatic.

aine '8%
scilline
namyl
caine
atannin
14%

Chemical Composition.—The leaves afford two alkaloids, one of which is volatile, and a peculiar variety of tannic acid, which strikes a dark green colour with ferric salts.

Official Preparations.—Ext. Cocæ Liq.; and Cocainæ Hydrochlor.

Truxillo leaves light green, very much broken up
Huanuco larger leaves [illegible] [illegible]
free from [illegible]

VITACEÆ or AMPELIDEÆ.

No. 37. Uvæ Passæ. *Raisins.*

The ripe fruit of the Vitis vinifera, dried by exposure to the sun's heat, or partially by sun's heat, and by artificial heat.

Habitat.—Indigenous to Western Asia, largely cultivated in Southern Europe.

Collection.—When the fruit is ripe the stalk is generally cut half through, or twisted, and the grapes allowed to hang for some time, when they gradually wither and shrink up. They do not fall off, the pedicels being nonarticulated to the branches. Frequently they are dipped two or three times in weak alkali, to remove the waxy covering, and afterwards dried by artificial heat.

Chemical Composition.—The pulp of the fruit contains acid tartrate of potassium, grape sugar, pectin, gum, and a little malic acid.

Official Preparations.—Tinct. Cardamomi Co.; Tinct. Sennæ.

ZYGOPHYLLACEÆ.

No. 38. Guaiaci Lignum. *Guaiacum Wood.*

Synonym:—Lignum Vitæ.

The heart-wood of Guaiacum officinale, and of Guaiacum sanctum.

Habitat.—Indigenous to the West Indian Islands and the northern coast of South America. Imported principally from the port of Hayti.

Description.—The wood as imported is generally denuded of its bark, and in the larger pieces the sapwood is found as a very thin layer. The heartwood is of a brown or brownish-green colour, changing to a lighter green on exposure: throughout its mass are found a number of zones, differing in the degree of their colour, which give to a section of the wood the appearance of a number of rings.

On account of its extreme hardness and durability it is largely used in ship carpentry, and for supports to the propellers of steamships. That which is met with in pharmacy is generally in raspings or shavings.

For use in pharmacy, it should be deprived of its sapwood.

Composition.—The heartwood contains the resin, 20 to 25 per cent., and, according to Fremy, 20 per cent. of cellulose and 30 per cent. of vasculose.

Official Preparation.—Dec. Sarsæ Co.

No. 39. Guaiaci Resina. *Guaiacum Resin.*

The resin obtained from the stem of Guaiacum officinale, or of Guaiacum sanctum, by natural exudation, by incision, or by heat.

Production.—In the islands of St. Domingo and Jamaica ~~Gonave~~, the resin is collected as a natural exudation, or by a system of puncturing or incising the bark. This constitutes the guaiacum resin in tears. By far the larger proportion is prepared from the old logs, which are supported on iron uprights, and pierced or grooved lengthwise on the side, or a large hole is made in the middle, and then both ends are set on fire. After a short time the resin melts and exudes as a dark thick liquid; it is allowed to run into small square boxes, which are covered inside with a piece of coarse cloth.

Characters.—In roundish or somewhat oval tears, or more commonly in large masses containing fragments of bark, wood, and other impurities; brownish or greenish-brown externally, and, when the surface has been rubbed and exposed to air and light, covered with a green powder. It is brittle, breaking with a clean glassy fracture; thin splinters are transparent and greenish-brown; powder greyish, but by exposure becoming green. Odour somewhat balsamic; and when chewed leaving an acrid sensa-

Tinct Guaiaci + Fe_2Cl_6 = Blue colour

tion in the throat. A solution in rectified spirit strikes a clear blue colour when applied to the inner surface of a paring of raw potato. 10%

Composition.—*Guaiaconic Acid, Guaiaretic Acid, Guaiacic Acid, Guaiac beta resin, and Guaiac Yellow, with small quantities of gum.

Adulteration.—Frequently, from careless manipulation, the resin contains a considerable quantity of wood, and colophony resin has been found in it. They can be detected by their different action towards solvents.

Official Preparations.—Mist. Guaiaci; Pil. Hydrargyri Subchloridi Co.; Tinct. Guaiaci Ammoniata.

RUTACEÆ.

No. 40. Ruta. *Rue.*

(Not official.)

The fresh herb of Ruta graveolens. stinking

Habitat.—Found growing wild in Southern Europe.

Description.—The Rue plant is a small evergreen herbaceous undershrub, with delicate green bipinnate leaves, supported on long petioles, varying from 1 to 4 inches in length, the lower leaves being the largest, triangular ovate in form, slightly coriaceous in texture, smooth, and dotted with numerous oil vesicles, with the margin slightly crenate. The flowers are pale yellow in colour, in terminal corymbs; fruit a 4 or 5 locular capsule with a number of vivid dark-coloured seeds. The whole plant possesses a strong persistent balsamic odour, and bitter acrid taste.

Composition.—The leaves and fruits, when distilled, yield a considerable amount of volatile oil; they also contain a peculiar principle, Rutin or Rutinic Acid.

Therapeutics.—Stimulant, Anti-spasmodic, and Emmenagogue.

Rutaceæ.

No. 41. Buchu Folia. *Buchu or Bucco Leaves.*

The dried leaves of 1 Barosma betulina, 2 Barosma crenulata, and 3 Barosma serratifolia.

Habitat.—All three sources are shrubby plants, growing to a height of two or three feet, indigenous to South Africa, particularly to the district of Cape Colony.

Characters.—1. Barosma betulina. The leaves vary from ½ to ¾ inch in length, cuneate or rhomboid-obovate in outline, generally obtuse with recurved apex, the margin is serrate-dentate, base entire, texture coriaceous.

2. Barosma crenulata. The leaves vary from ¾ to 1 inch in length, oval-oblong, or rhomboid-oval; apex obtuse, margin serrate-crenate, base prolonged into a distinct petiole.

3. Barosma serratifolia. The leaves are from 1 to 1½ inch long, linear lanceolate tapering at both ends, actual apex truncate, midrib prominent, margin sharply and closely serrate.

The first two varieties occur usually mixed, and are more closely allied in their characters; the leaves of the last species materially differ in shape and texture, and commercially are known as long buchu. At the base of each crenature or serrature there is always a minute oil gland. In colour, the leaves are of a dull green, paler on the under surface, and throughout the mass of the leaves there are numerous oil glands or cells.

Composition.—Buchu leaves yield on distillation with water a volatile oil.

The substance called diosmin, isolated by Landerer, has not been found in more recent investigations of this drug.

Substitutes.—Buchu leaves as imported are mixed with a large number of the capsular fruits and flowers of the same plant. The leaves of Empleurum serrulatum are occasionally found. They are much longer than either of the buchus, they possess a similar structure to buchu leaves, but are distinguished by their extreme length and glandless

Rutaceæ.

acute apex, and by their want of aroma. After keeping for some time they acquire a yellow colour.

Therapeutics.—A diuretic and diaphoretic, used chiefly for its action on the urinary organs.

Official Preparations.—Inf. Buchu; Tinct. Buchu.

Bru
Nux Vomica + HNO_3 red colour

No. 42. Cuspariæ vel Angusturæ Cortex. *Cusparia or Angustura Bark.*

The bark of Galipea ~~Cusparia~~. Febrifuga

Habitat.—This tree grows on the mountains adjoining the watershed of the Orinoco.

Imported by way of Trinidad.

Characters.—The bark occurs in flattish or channelled pieces, from 3 to 6 inches in length. It is of a yellowish brown colour internally, externally the epidermis is frequently coated with a greyish, scurfy, corky layer, which is easily removed by scraping with the finger nail. The inner edge is often obliquely cut, so as to present a bevelled appearance; the inner surface is often lamellar and has occasionally thin strips of wood attached. Fracture smooth, slightly granular, and exhibits a large number of minute striæ of glistening crystals of calcium oxalate, best noticed with a good lens. Taste bitter and aromatic, and the bark when bruised has a disagreeable odour. More recently this bark has occurred in much longer pieces, somewhat quilled.

Composition.—The bark contains several alkaloids, a little resin, volatile oil, and wax.

Adulterations.—Cusparia Bark early in the century wa sometimes sophisticated with the so-called false angustura bark derived from Strychnos Nux Vomica, but it is never found in commerce now. Strychnos Nux Vomica Bark is more irregular in form, and paler in transverse section. Its fracture is smooth, and there is an absence of white striæ. Externally it is covered with a fine grey epidermis, with occasional brown-coloured patches of cork and white warts;

Transverse Sect. Cusparia Xtallin Striations
Bev Edge

Rutaceæ.

internally it does not present a laminated surface or structure like that of cusparia. Taste intensely bitter, but not aromatic. An infusion or decoction of this bark is coloured a bright red on the addition of nitric acid, whereas an infusion of cusparia is not affected. This is much more reliable than the method of touching the bark with nitric acid.

Therapeutics.—An aromatic tonic and febrifuge.

Official Preparation.—Inf. cuspariæ.

No. 43. Jaborandi. *Jaborandi or Pilocarpus.*

The dried leaflets of Pilocarpus ~~pennatifolius~~ Jaborandi.

Habitat.—Pernambuco. S. A. now brazil

Characters.—Leaves are imparipinnate, and vary from 4 to 10 shortly-stalked leaflets, usually 4 inches in length, and the terminal one generally with a longer stalk, oval or ovate oblong, unequal at the base, obtuse, and nearly always emarginate, revolute, and entire at the margins. The upper surface shining and dull green, under surface paler, slightly hairy, and with a very prominent midrib, veins anastomosing, and reaching to near the margins. Texture coriaceous. The whole mass of the lamina is marked irregularly with numerous pellucid dots or glands. Odour, on bruising, somewhat aromatic, but the entire leaves are almost inodorous, taste aromatic, and slightly bitter, but subsequently warm and pungent, increasing the flow of saliva.

Composition.—The leaves yield a volatile oil, and a non-volatile alkaloid, Pilocarpine or Jaborandine.

Adulteration.—Jaborandi leaves are occasionally mixed with the leaves of other species of Pilocarpus, and recently the leaves of a kind of Piper have been offered in the London market as Jaborandi. They are thinner, and although finely granular, do not present the pellucid punctate appearance of true Jaborandi.

Therapeutics.—Diuretic, diaphoretic, and expectorant.

Simarubaceæ.

Used in the preparation of Ext. Jaborandi, Inf. Jaborandi, Tinct. Jaborandi, Pilocarpinæ Nitras.

SIMARUBACEÆ.

No. 44. **Quassiæ Lignum.** *Quassia Wood. Bitter Wood.*

The chips, raspings, or shavings of the wood of Picræna excelsa. Lindl

Habitat.—Indigenous to the islands of Jamaica, St. Vincent, and Antigua, where the tree attains a height of 70 feet.

Characters.—As imported, Jamaica quassia, or bitter wood, is found in billets, varying in length and size from 2½ to 7 feet in length, from 3 to 20 inches thick, and occasionally covered with a dark grey bark. The wood is dense, tough, porous, and of a light yellowish white colour, and of medium hardness. It is inodorous, with an intensely and purely bitter taste. As used in pharmacies it is found in raspings, chips, or shavings. The wood is frequently turned in the form of cups or tumblers, which are known as Bitter Cups. A watery infusion shows a slight fluorescence, especially if a little caustic lime be added.

Composition.—A neutral principle, Quassiin, to which it owes its intense bitterness, and a little resin. Quassia is one of the few bitters which, from containing no tannin, are prescribed with ferric salts.

Substitutes.—Surinam Quassia, which frequently finds its way to this country, is obtained from Quassia amara, a tree indigenous to Surinam (Guiana). The billets are much smaller, rarely exceeding 4 inches in diameter, but principally in thinner pieces. The wood is denser, and of a more compact texture.

Therapeutics.—A bitter stomachic and tonic.

Official Preparations.—Ext. Quassiæ, Inf. Quassiæ, Tinct. Quassiæ.

No. 45. Simarubæ Cortex. *Simaruba Bark.*

(Not official.)

The bark of the root of the Simaruba officinalis (Simaruba amara) and Simaruba medicinalis.

Habitat.—The first species is found as a large tree in Venezuela and Northern Brazil. The second species is indigenous to the West Indian Islands and Central America.

Characters.—Simaruba bark occurs in quilled or curved pieces, several feet in length. When the suberous layer is present it has an uneven, rough appearance, and is externally of a brownish colour. As usually met with, the bark is of a yellowish grey colour, tough, fibrous, and breaks with difficulty, and the inner surface is slightly striate.

Composition.—A bitter principle supposed to be identical with quassiin; also a little resin, volatile oil, and calcium salts of organic acids.

Therapeutics.—Bitter tonic.

RHAMNACEÆ.

No. 46. Rhamni Fructus. *Buckthorn Berries.*

(Not official.)

The dried ripe fruits of Rhamnus catharticus.

Habitat.—Indigenous to this country, and throughout Europe generally.

Characters.—The fruit in the fresh condition is a black, glossy, spherical, four-celled drupe, about the size of a small pea, with the remains of the calyx attached to its base. Each cell contains a hard, dark-coloured grooved seed. The unripe fruit is green, becoming black on ripening. The dried fruit is deeply wrinkled, due to the contraction of the succulent sarcocarp.

Rhamnaceæ.

The endocarps have a sharp angle on the inner face, and have therefore a triangular transverse section.

Composition.—Buckthorn berries contain rhamno-cathartin, rhamnine, rhamnegin, sugar, and gum.

The true purgative principle has not been isolated.

The juice, obtained from the unripe fruits by bruising and fermenting, and adding a little alum, constitutes, on evaporation, the pigment called Sap-green.

The juice should be of Sp. gr. 1·070 to 1·075. It is chiefly used to make Syrupus Rhamni, a domestic purgative very apt to cause griping.

No. 47. **Rhamni Frangulæ Cortex.** *Frangula Bark, Alder Buckthorn.*

The dried bark of Rhamnus Frangula (Frangula vulgaris). Collected from the young trunk and medium-sized branches, and kept at least one year before being used.

Habitat.—A shrubby plant, growing throughout Europe in moist hilly woods or damp situations.

Characters.—Alder Buckthorn bark occurs in small quills from one-twenty-fifth to one-twelfth of an inch in thickness, externally of a greyish brown, or, if collected from the younger branches, a black-brown corky layer marked with numerous transverse small whitish lenticels or suberous warts; internally of a brownish yellow or dark orange-yellow. Smooth, breaks with a short fibrous fracture, which, on examination, shows a purplish-coloured layer externally, a greenish middle layer, and yellow bast fibre internally. When fresh it has a disagreeable odour and taste, but becomes odourless on drying, with a slightly bitter and sweetish pleasant taste. When moistened on the inner surface with a drop of potassium hydrate solution it acquires a dark red colour.

Composition.—This bark contains frangulin, resin, tannin, and an amorphous bitter principle.

Therapeutics.—Mild purgative, useful in chronic constipation.

Official Preparations.—Ext. Rhamni Frangulæ, and Ext. Rhamni Frangulæ Liq.

No. 48. **Rhamni Purshiani Cortex.** *Sacred Bark, Cascara Sagrada.*

The dried bark of Rhamnus Purshianus (Frangula Purshiana).

Habitat.—Indigenous to the west coast of North America, extending southwards to California.

Characters.—In quills or in curved pieces of varying lengths and sizes, the bark itself being from about one-twenty-fifth to one-eighth of an inch thick, smooth or nearly so externally, covered with a greyish-white layer, which usually is easily removed, and is frequently marked with spots or patches of adherent lichens. Beneath the surface it is violet brown, reddish brown, or brownish; and internally reddish-brown or yellowish-brown, and nearly smooth, although somewhat striated longitudinally. Fracture short, except internally, where it is slightly fibrous, more especially in the larger pieces. No marked odour; taste bitter. It is frequently imported in flattened packets, consisting of small pieces of the bark compressed into a more or less compact mass.

Composition.—Rhamnus Purshianus bark contains three resins, a neutral crystalline principle, tannin, malic and oxalic acids, and a minute quantity of volatile oil, having the characteristic odour of the bark.

Substitutes.—The barks of Rhamnus Californica, and R. Caroliniana are used in some districts of North America in place of the Cascara Sagrada.

Official Preparations.—Ext. Cascaræ Sagradæ and Ext. Cascaræ Sagradæ Liq.

ANACARDIACEÆ.

No. 49. **Mastiche.** *Mastich.*

A concrete resinous exudation obtained by making slight incisions in the bark of the stem and large branches of Pistacia Lentiscus, the Lentisk.

Habitat.—Indigenous to the shores of the Mediterranean; mainly obtained from the island of Scio, and others of the Grecian Archipelago.

Secretion.—The resin is found principally in the bast layer of the bark, of the stem and branches; it is contained in elongated resin ducts, surrounded by a number of small cells which secrete the resin.

Collection.—To obtain the resin, which is contained in the bark only, and not in the wood, slight vertical incisions are made in June and July. After exuding for a period of three weeks, the tears are carefully removed, and then dipped in sea-water, and finally dried by exposure to the air. A good tree yields about ten pounds of mastich.

Characters.—In rounded, irregular, oblong, or pear-shaped tears, of a pale yellow colour, and either opaque and dusty on their outer surface, or far more frequently having a glassy and transparent appearance; brittle, and breaking with a vitreous, conchoidal, pale-yellow fracture. Odour agreeable, somewhat balsamic, and terebinthinate; taste mild and resinous; becoming plastic when chewed; entirely soluble in ether. Sp. gr. 1·06 to 1·08. It is soluble in alcohol to the extent of 90 per cent., and this solution reddens tincture of litmus; entirely soluble in oil of turpentine, chloroform, or ether.

Composition.—A minute quantity of a volatile oil, and two resins.

Masticic Acid or alpha-resin occurs to the extent of 90 per cent., and is freely soluble in alcohol, ether, chloroform, and oil of turpentine. Masticin, or beta-resin, is insoluble in alcohol, but readily soluble in ether.

Adulterations.—Sandarach is liable to be mistaken for mastich. It is the resinous exudation of Callitris quadrivalvis (Nat. Ord. Coniferæ), a tree found throughout the northern coasts of Africa, which yields a resin very similar in appearance to mastich, but the tears are more elongated, with a glassy fracture, transparent, of a pale yellow colour, and almost entirely soluble in alcohol. When masticated it is brittle and pulverulent, with a marked terebinthinate taste.

Therapeutics.—The action is the same as that of the resin of turpentine ; it is but little used. From the agreeable odour which it communicates to the breath, it is sometimes employed as a masticatory. Dissolved in chloroform or ether, it is often used for stopping carious teeth.

No. 50. **Terebinthina Chia**, vel **Cyprica**. *Chian* or *Cyprian Turpentine.*

(Not official.)

An oleo-resin obtained by making incisions in the bark of Pistacia Terebinthus.

Habitat.—The Grecian Archipelago.

Collection.—The oleo-resin is contained in resin ducts similar to those secreting mastich. The bark is slightly incised, and the exudation goes on during the spring and summer. The resin is removed by scraping from time to time, and purified by melting and straining.

Characters.—The oleo-resin is a soft solid, becoming semi-fluid on the slightest application of heat, transparent, entirely soluble in alcohol, benzol, and glacial acetic acid. It has a pleasant but slight terebinthinate odour and a taste resembling mastic, and not bitter.

Composition.—Chian turpentine yields on careful distillation 15 per cent. of a volatile oil, possessing the characteristic odour of the drug.

Adulteration.—The different resins left after the distillation of oil of turpentine are sometimes substituted, also the dry clear resin obtained from Canada balsam ; on warming they emit a strong terebinthinate odour.

Therapeutics.—Chian turpentine has been used in cases of uterine cancer for some time, but is of doubtful value in this disease.

BURSERACEÆ or AMYRIDACEÆ.

No 51. Myrrha. *Myrrh.*

A gum-resinous exudation obtained from the stem of Balsamodendron Myrrha.

Habitat.—The Somali country, Eastern Africa, and South-Western Arabia. It is usually shipped from Berbera or Aden to Bombay, and thence to this country.

Secretion.—Myrrh appears to be chiefly deposited in the layers of the bark, and a small proportion in the medulla.

Collection.—Myrrh is an exudation, partly natural, and partly obtained by puncturing the bark. It first exudes as a thick oily substance, gradually acquiring a firmer consistency, of a yellowish-white appearance, ultimately becoming of a dark reddish colour. It is mainly collected by the Somalis, who, besides obtaining it in their own country, cross over to Arabia, and pay tribute to the Fadhli tribe for the privilege of collecting it there.

At one time myrrh entered into commerce through Smyrna, and other ports of the Levant, and thus obtained the name Turkey myrrh.

Characters.—In roundish or irregularly formed tears, or masses of agglutinated tears, varying very much in size; reddish-brown or reddish-yellow externally, dry, and more or less covered by a fine powder; brittle, the fractured surface irregular, somewhat translucent, rich brown, oily, and frequently marked with opaque whitish spaces or striæ. Odour agreeable, aromatic; taste aromatic, bitter, and acrid.

Composition.—Gum, resin, and volatile oil.

The gum is found in quantities varying from 45 to 75 per cent. Its solution is only partly precipitated with neutral plumbic acetate, 20 to 25 per cent. remaining in solution, showing that it is composed of two gums, one being identical with gum acacia. The residue left after making tincture of myrrh is the gum, and is admirably suited for rendering labels adhesive.

Other varieties of Myrrh.—As imported, myrrh varies [illegible] Balsamodendron

much in appearance, and is frequently separated or picked over at Aden or Bombay. It is frequently mixed with other gum-resins obtained from different species of Balsamodendrons growing in the same districts.

Bdellium is a gum-resin, of which there are three varieties, namely, East Indian Bdellium, African Bdellium, and Opaque Bdellium. The first has an odour resembling cedar, and softens when held in a warm hand; the second is hard, with a resinous fracture and often a white powdery surface; the third is opaque, and has, like the Indian Bdellium, a very acrid taste.

Therapeutics.—Stimulant, Aromatic, Tonic, and Antiseptic.

Used in the preparation of Dec. Aloes Co., Pil. Aloes et Myrrhæ, Pil. Assafœtidæ Co., Pil. Rhei Co., Mist. Ferri Co., and Tinct. Myrrhæ.

No. 52. Elemi. *Manila Elemi.*

[illegible] B.P.

A concrete resinous exudation probably obtained from Canarium commune. The actual botanical source of this drug is undetermined. Chiefly imported in barrels from Manila.

Habitat.—Manila and neighbouring Philippine Islands, where the tree is indigenous.

Characters.—When fresh, it is soft, granular, resinous, and colourless, but by keeping it becomes harder, and of a pale yellow tint. Odour strong and fragrant, somewhat resembling fennel and lemon, taste aromatic, warm, and acrid.

Composition.—A volatile oil, two resins, also neutral principles soluble in water, and elemic acid.

Varieties.—Under the name Elemi several resinous products are occasionally imported into this country, probably all produced by plants of the Nat. Ord. Burseraceæ; the following are a few of them:—

1. Brazilian Elemi is a soft yellowish solid, with an agreeable terebinthinate odour.

Burseraceæ.

2. Mauritius Elemi closely resembles Manila Elemi, but remains longer fluid after exudation.

3. Mexican Elemi occurs in dark or pale yellow masses, brittle, and having an oily fracture, and when masticated readily softens.

Therapeutics.—Externally as a stimulant to sluggish sores. Used in the preparation of Ung. Elemi.

No. 53. Olibanum. *Frankincense.*

(Not official.)

A gum-resinous exudation obtained from several species of Boswellia—chiefly from B. Bhau-Dajiana, B. Carterii (a polymorphic species), and B. Frereana, the latter yielding the Frankincense in whitish masses, not in tears, and probably other species.

Habitat.—Nubia, Abyssinia, and Southern Arabia; but Frankincense is collected chiefly in Somaliland, and a little in South Arabia.

Collection.—The Somalis, who collect this gum-resin, make a long deep incision into the bark, generally twice a year. On exuding, the gum-resin appears as a milky fluid, which rapidly hardens, and is then collected. The finer tears are separated from those of inferior quality. It is collected during the dry seasons, and is shipped to this country by way of Aden or Bombay.

Characters.—Olibanum is generally found in irregularly-shaped tears, of a roundish form; in colour white or pale yellow, frequently marked with spots, and covered with a white powder, formed by the attrition of the tears; fracture conchoidal, waxy; taste slightly bitter and balsamic; odour fragrant, intensified on heating. When triturated with water it forms a nearly white emulsion. Inferior Olibanum is much darker in colour, and frequently pieces of the bark remain attached to the tears.

Composition.—Resin, volatile oil, and gum.

Volatile Oil.—Obtained on distillation in varying quantities, from 4 to 7 per cent.

The resin is not uniformly distributed throughout the tears, which often present a stratified appearance. When extracted by alcohol the quantity varies from 57 to 75 per cent.

Therapeutics.—Stimulant and rubefacient; used chiefly for incense.

LEGUMINOSÆ.

No. 54. Glycyrrhizæ Radix. *Liquorice or Licorice Root.*

The root and underground stems, fresh and dried, of Glycyrrhiza glabra. There are several marked varieties of this species, one of which, var. typica, is indigenous to Southern Europe, cultivated in Germany, France, and England; another, var. glandulifera, is found principally in Central and Northern Europe.

Habitat.—Cultivated in Yorkshire and at Mitcham.

Characters.—When fresh, in long cylindrical pieces of varying thickness, smooth and yellowish-brown or somewhat reddish externally, yellow and juicy internally, very flexible, easily cut, and consisting of a thick cortical portion surrounding a central woody axis, which in the case of the stem contains a small pith. Odour peculiar, earthy, and somewhat sickly; taste strong, peculiar, sweet. When dried it is either peeled or unpeeled. In the latter case it has essentially the same character as the fresh root, except that it is somewhat darker, furrowed longitudinally, and has a slightly acrid, and, in some cases, a feebly bitter taste, combined with the characteristic sweetness; but when peeled it has a yellow colour externally, and there is no acridity.

Radix Glycyrrhizæ Russica.—This root is mainly obtained from var. glandulifera, but Glycyrrhiza echinata is cultivated in Russia as well. Russian Licorice consists chiefly of the main root, and a few stolons, and is about 8 to 16 inches in length, and 1 to 4 inches thick. Sometimes

Glycyrrhizin + H_2SO_4 boils = forms Glycyrrhetin

Leguminosæ.

deprived of its dark brown corky layer; colour greyish-yellow; wood fibrous, soft, and porous; taste sweet and afterwards slightly bitter.

·3 % *Composition.*—Glycyrrhizin; sugar; starch; acrid oily resin.

Therapeutics.—A sweet demulcent.

Used in the preparation of Confec. Terebinthinæ, Dec. Sarsæ Co., Ext. Glycyrrhizæ, Ext. Glycyrrhizæ Liq., Inf. Lini, Pil. Hydrargyri, Pil. Ferri Iodidi, Pulv. Glycyrrhizæ Co.

No. 55. **Chrysarobinum.** *Chrysarobin.*

Is a mixture of proximate principles extracted from Araroba (Goa powder) which is a powdery substance deposited in the heart-wood of the stem of Andira Araroba.

Habitat.—Andira Araroba is a large leguminous tree found in Brazil and the damp forests of Bahia.

Characters.—As Goa powder and the extract obtained from it are frequently mistaken for one another, they will be described separately. This same mistake has crept into the present Pharmacopœia, the source given being that of Goa powder, whilst the characters described apply to Chrysarobin. 80 %

Araroba, or Goa powder, as met with in commerce, is a rough, dirty, yellowish or brownish powder, frequently mixed with lumps, which, when broken, present a canary-yellow colour internally; the taste is slightly acrid and bitter. When a portion is heated between two watch-glasses, the upper one is covered with a fine crystalline sublimate, which gives a bright red colour on addition of solution of ammonia. Araroba is obtained by cutting down the trees and splitting the wood, and removing the powder from the cavities. It is found only in the heart-wood and throughout its entire mass, and appears to be produced by a physico-chemical process which causes a metamorphosis of the woody tissue.

Chrysarobin is a light brownish-yellow finely crystalline powder, tasteless, odourless, very sparingly soluble in water,

KING'S COLLEGE

more so in alcohol (7 per cent.), readily in ether or boiling benzol.

Composition.—Chrysarobin, as obtained from araroba, by exhaustion with boiling benzol, is not quite pure; it can be purified by crystallization from glacial acetic acid, from which it separates in yellow scales. Chrysarobin was formerly regarded as chrysophanic acid, until it was ascertained to be a definite principle now named chrysarobin or chrysophan. Chrysophanic acid is also found in rhubarb, senna, and various other drugs, and is one of the chief constituents of the yellow colouring matter of many lichens.

Therapeutics.—Chrysarobin is as frequently prescribed as chrysophanic acid, and is used in cases of psoriasis and other skin diseases; internally it acts as a purgative.

Official Preparation.—Unguentum Chrysarobini.

No. 56. Indigo. *Indigo.*

A blue pigment extracted from various species of Indigofera, the most important being Indigofera tinctoria and I. argentea; it is also obtained from Polygonum tinctorium (Polygonaceæ), and Isatis tinctoria (Cruciferæ).

Habitat.—Cultivated in tropical and sub-tropical countries; largely imported from India.

Preparation.—The twigs and leaves are collected, chopped, and macerated in water for some time, when fermentation takes place; after a time the liquid is decanted and poured into shallow vessels, and exposed to the air, being repeatedly agitated, so as to facilitate the oxidation of the chromogen indican, and thus cause the crude indigo to be deposited. The supernatant liquid is decanted, and the precipitated indigo collected, pressed, and dried. This constitutes commercial indigo.

Characters.—Indigo is generally met with in hard, brittle, porous masses, or in cubical cakes, of a deep blue colour, tasteless, and inodorous. Commercial indigo is very impure, containing indigo gluten, indigo red, and indigo brown.

Leguminosæ.

It is readily soluble in strong sulphuric acid, insoluble in alcohol or acetic acid.

Composition.—Commercial indigo contains indigo blue or indigotine, varying in amount from 50 to 70 per cent. ; it also contains indigo gluten, soluble in dilute acetic acid ; indigo brown, soluble in solution of potassium hydrate ; and indigo red, or resin, soluble in alcohol.

Indigo sulphate or sulphindigotic acid, is prepared by dissolving indigotine in strong sulphuric acid, and is used as a test reagent.

Official Preparation.—Solution of Indigo Sulphate.

No. 57. Tragacantha. *Tragacanth.*

A gummy exudation obtained by making incisions in the stem of Astragalus gummifer and other species.

Habitat.—Most of the species are low shrubs, indigenous to Greece, Asia Minor, and Persia.

Collection.—Tragacanth is obtained by natural exudation or by incision. That which exudes spontaneously assumes an irregularly globular or conical shape, and rapidly hardens, acquiring a yellowish-brown colour ; formerly commercial tragacanth was the naturally exuded gum, more recently the peasants are in the habit of puncturing the bark and wood, or of making deep incisions right into the pith, after which the gum exudes rapidly, and in three or four days it is collected in flakes.

Characters.—Tragacanth occurs in white or somewhat yellowish flaky pieces, varying in length and breadth, and consisting of different layers, and marked with parallel ridges ; the flakes are then irregularly oblong or roundish, spirally twisted, or in curved narrow bands, translucent, tough, inodorous, and tasteless, difficult to powder, unless the temperature is raised to 120° F. It is sparingly soluble in water, but swells up into a gelatinoid mass ; with a large quantity of water it forms a ropy liquid.

Composition.—Tragacanth contains two gums, one soluble and the other insoluble; it also contains from 13 to 20 per cent. of water, and yields, on incineration, 2½ to 3½ per cent. of ash.

The soluble gum differs from arabin in giving a precipitate with neutral plumbic acetate, and forming a clear mixture when added to a solution of borax; but it is apparently closely allied to arabin, as it gives the same precipitates with ammonium oxalate solution and with rectified spirit.

The insoluble gum has been named respectively Tragacanthin, Adraganthin, and Bassorin.

Adulteration.—Sophistication of this gum is sometimes carried on at Smyrna with inferior sorts of tragacanth locally known as Caramania or Mosul Gums. The Caramania gum is in angular pieces of a dirty-white colour, hence it is damped by steaming and then whitened with lead carbonate or chalk. This variety is used to adulterate the small tragacanth "sorts." Mosul gum is found in nodular masses of a dull brown colour; prior to using it for admixture it is broken up.

Caramania gum may be recognized by occurring in small angular pieces.

Official Preparations.—Conf. Opii., Conf. Sulphuris, Glycer. Tragacanthæ, Mucil. Tragacanthæ, Pulv. Opii Co., Pulv. Tragacanthæ Co.

No. 58. Setæ Mucunæ. *Cowhage.*

(Not official.)

The hairs removed from the outer surface of legumes of Mucuna pruriens (Dolichos pruriens).

Habitat.—Found growing wild throughout the tropical regions of India, America, and Africa; it is also cultivated in the East and West Indies.

Characters.—The legumes are from 2 to 5 inches in length, and when immature present a downy appearance; finally the hairs increase in size from $\frac{1}{10}$ to $\frac{1}{8}$ of an inch in length, become rigid, sharply pointed at the apex, and of a glossy brown colour, and mostly filled with a brown granular secretion.

Leguminosœ.

When applied to the skin the sharp points penetrate the pores and set up an unbearable itching, which is partly alleviated on applying oil.

Composition.—The hairs contain a small quantity of tannic acid and resin, but little is known of the composition of the latter.

No. 59. Scoparii Cacumina. *Broom Tops.*

The fresh and dried tops of Cytisus Scoparius (Sarothamnus Scoparius).

Habitat.—Indigenous to Europe and Great Britain.

Characters.—Broom Tops are long, thin, branched, straight, flexible, pentangular, winged, dark green or yellowish-green, smooth, not spiny, generally free from leaves, but if leaves are present, sessile, small and simple above, stalked and trifoliate below. Taste bitter and disagreeable; odour when fresh and broken, peculiar; when dry, almost inodorous.

·3%

Composition.—Scoparin and Sparteine and a bitter principle.

Allied Species.—The Spanish Broom, Cytisus junceus closely resembles the preceding species. The stems and branches are cylindrical and smooth, and are thus distinguished from the angular tops of the official broom. It flowers in July, but Cytisus Scoparius in May.

Therapeutics.—Scoparin is a diuretic, Sparteine a cardiac tonic.

Official Preparations.—Dec. Scoparii and Succus Scoparii.

No. 60. Pterocarpi Lignum. *Red Sandal Wood.*

The sliced or rasped heart-wood of Pterocarpus santalinus.

Habitat.—This small tree grows wild in the forests of the Madras Presidency, but is cultivated in Southern India and Ceylon.

Leguminosæ.

Characters.—As imported, Red Sandal Wood is met with in heavy, hard billets, from which the light-coloured sap-wood has been removed. The wood is valued for turnery. As met with in Pharmacies it occurs in raspings, or a coarse, irregular, brown-red powder.

Composition.—Red Sandal Wood contains a colouring principle, santalic acid or santalin, also santal and pterocarpin, with minute traces of tannic acid.

Therapeutics.—It is chiefly used as a colouring matter. Used in the preparation of Tinct. Lavandulæ Co.

Inspissated

No. 61. Kino. *Kino.*

The juice obtained from incisions made in the trunk of Pterocarpus Marsupium, and inspissated without artificial heat.

Pterocarpus Indicus yields also a kino, which is sometimes exported to this country in a semi-liquid state.

Habitat.—Indigenous to India and Ceylon.

Collection.—The tapping of the trees is carried on in the government forests of the Malabar coast, under certain restrictions, and a small fee is always charged. The collector makes a long perpendicular incision, and a number of lateral ones running into it; at the base of the incision a vessel is placed to receive the exuding kino, which is of a bright red colour; it is then dried by exposure to the sun and air, and afterwards packed for shipping.

Characters.—Kino consists of small irregular glistening opaque reddish-black brittle fragments about the size of a pea, which in thin laminæ, and at the edges, are ruby red and transparent; it is inodorous, with a very astringent taste, and softens on chewing, tinging the saliva a blood red.

Composition.—Kino contains kino-tannic acid and minute quantities of pyrocatechin; it also contains kino-red. It does not contain any catechuic acid. Kino-tannic acid is closely related to the tannic of catechu.

Leguminosæ.

Varieties of Kino.

1. Botany Bay Kino, obtained from Eucalyptus resinifera, E. rostrata, and E. corymbosa, and others. Natural order Myrtaceæ.
2. Jamaica or West Indian Kino, obtained from Coccoloba uvifera. Natural order Polygonaceæ.
3. African or Gambia Kino, obtained from Pterocarpus erinaceus. This is not often met with in commerce.
4. Bengal or Palas Kino, obtained from Butea frondosa. Natural order Leguminosæ.
5. American Kino.

Therapeutics.—Astringent, used for diarrhœa and diseases of the mucous membrane.

Used in the preparation of Pulv. Kino Co., Tinct. Kino, and Pulv. Catechu Co.

No 62. Balsamum Peruvianum. *Balsam of Peru.*

A balsam exuded from the trunk of Myroxylon Pereiræ after the bark has been beaten, scorched, and removed.

Habitat.—San Salvador in Central America, where the trees grow to a height of 50 or 60 feet.

Collection.—The native Indians commence the collection of the balsam just after the rainy season, about the beginning of December. The bark, for a considerable distance up the trunk of the tree, is well beaten with a blunt instrument until it is completely separated from the wood; this is done on four sides, allowing an interspace of untouched bark to remain, so as not to kill the tree. A week afterwards the bark is scorched with burning torches, and in a few days is easily removed. The exposed surface of the wood is now covered with rags, or any suitable absorbent material, which take up the exuding balsam, and these, when saturated, are gently boiled in water, after which most of the heavy balsam sinks; the rags are now removed, and placed in a bag made of rope, and thoroughly pressed by twisting, until no more balsam exudes. This process is repeated as long as any balsam exudes from the trunk. The water is then decanted from the balsam, which

Leguminosæ.

is bottled and carried to the coast. Balsam of Peru is principally exported from the port of Acajutla, but some from Lima or Valparaiso.

Characters.—Balsam of Peru is a viscid liquid, of the consistency of treacle; of a dark brown-black colour when examined in quantity, but in thin layers a deep reddish brown, and transparent. Odour agreeably aromatic, and slightly smoky, particularly on warming. It has an acid reaction. Taste somewhat bitter and acrid, followed by a burning sensation in the throat.

Composition.—Balsam of Peru is a complex mixture, containing benzoic and cinnamic acids, combined with benzylic alcohol and resin.

Cinnamein or Benzylic Cinnamate. This aromatic compound ethereal is the principal constituent in the balsam, amounting to nearly 60 per cent., and is readily extracted by agitating the balsam with twice its volume of petroleum ether, decanting the clear supernatant liquid, and carefully removing the petroleum ether with a gentle heat; the almost colourless residue is cinnamein.

Cinnamic acid and Benzoic acid are easily removed by agitating the balsam with solution of ammonia, separating the solution, and precipitating the mixed acids with hydrochloric acid.

Adulterations.—Balsam of Peru is very frequently submitted to a systematic adulteration with fixed oils, copaiba, turpentine, resin, alcohol, gurgun balsam, storax, and benzoin.

White Balsam of Peru is prepared in San Salvador by submitting the legumes of Myroxylon Pereiræ to pressure. It is obtained as a golden yellow, granular, semifluid mass, becoming hard on keeping, having an odour resembling Tonka beans. This is not an article of commerce in England.

Therapeutics.—Stimulant and expectorant.

No. 63. Balsamum Tolutanum. *Balsam of Tolu.*

A balsam which exudes from the trunk of Myroxylon Toluifera, after incisions have been made in the bark.

Leguminosæ.

Habitat.—Found growing in the high plateaux of New Granada and Venezuela.

Collection.—Two long slanting incisions are made through the bark, and finally meet at their lower end, forming an angle underneath. Below this cut the bark and wood is a little hollowed out so as to allow of a calabash cup being inserted to collect the balsam. The cups are emptied into leather bags, and then carried to the coast, where the balsam is run into tin drums for exportation.

Characters.—When imported, Tolu Balsam is a soft tenacious solid, gradually hardening, and becoming quite brittle in cold weather. In thin laminæ it is perfectly transparent, and of a yellowish or reddish-brown colour. When pressed between glass plates, and examined under the microscope, numerous crystals of cinnamic acid are visible. Odour fragrant and aromatic, faintly resembling vanilla; taste aromatic. It is soluble in alcohol, and the solution has an acid reaction.

Composition.—The principal constituent of Tolu Balsam is an amorphous resin, which is insoluble in carbon bisulphide. It contains nearly 8 per cent. of cinnamic and benzoic acids.

Adulteration.—Turpentine resin is sometimes mixed with the balsam. When the balsam is triturated with twice its volume of strong sulphuric acid, it becomes of a cherry red colour, but if turpentine is present it will be black. Turpentine is also removed if the balsam adulterated with it be shaken with carbon bisulphide.

Therapeutics.—Stimulant and expectorant.

Used in the preparation of Pil. Phosphori, Syr. Tolutanus Tinct. Tolutana, and Tinct. Benzoini Co.

No. 64. Physostigmatis Semen. *Calabar Bean.*

The dried seed of Physostigma venenosum.

Habitat.—This plant is found growing on the banks near the mouths of the Niger and Old Calabar Rivers, in the Gulf of Guinea, Western Africa. It is also cultivated

Leguminosæ.

in India and Brazil, where it was introduced some years since.

Characters.—From about one inch to one inch and a quarter long, three-quarters of an inch broad, and half an inch or somewhat more in thickness; oblong and more or less reniform, and with a long, broad, blackish furrow running entirely alone its concave side. Testa hard, brittle, roughish, deep chocolate-brown or brownish-red, and enclosing a closely adhering nucleus which principally consists of two hard, white, brittle cotyledons, separated from each other by a somewhat large cavity. Inodorous, and has no marked taste beyond that of an ordinary bean. It yields its virtues to alcohol, and imperfectly to water. The cotyledons when moistened with solution of potash acquire a permanent pale yellow colour.

Composition.—Calabar Bean contains two powerfully poisonous alkaloids: Physostigmine or Eserine, and Calabarine; and a neutral body, Phytosterin.

The seeds on incineration leave 3 per cent. of ash, mainly composed of potassium phosphate.

Adulteration.—Calabar Bean is not subject to a systematic sophistication. Occasionally the seeds of another species, Physostigma cylindrosperma, are met with. They are longer, and more cylindrical.

The seeds of a species of Mucuna, and other leguminous plants, are sometimes sent over to this country as Calabar beans, but in size and character they bear no resemblance to the genuine article.

Dose in powder.—1 to 4 grains.

Official Preparation.—Ext. Physostigmatis.

No. 65. Semen Fœni-græci. *Fœnugreek.*

(Not official.)

The seeds of Trigonella Fœnum-græcum.

Habitat.—Fœnugreek is an annual, indigenous to Asia Minor, and has become naturalized in Southern Europe and Northern and Eastern Africa.

Leguminosæ.

Characters.—The seeds are contained in linear curved flattened legumes, and vary in number from 12 to 20. They are about one-eighth inch long, having a rhomboidal form; they are flattened, hard, and of a pale brownish-yellow colour. The hilum is situated on the sharper edge, from which there runs a deep furrow, almost dividing the seed into two unequal lobes; odour strong, resembling that of celery seed or of the bark of *Ulmus fulva.* Taste bitter.

Composition.—A considerable proportion of mucilage, tannin, and a bitter acrid resin.

Adulteration.—Powdered Fœnugreek is frequently adulterated with farinaceous substances, which are readily detected by the iodide of starch reaction.

Production.—Although Fœnugreek is largely cultivated in the South of France and Morocco, the bulk is produced in Egypt, and shipped at Alexandria.

Uses.—Chiefly used in the manufacture of cattle foods; also in curry powder.

No. 66. Hæmatoxyli Lignum. *Logwood.*

The sliced heart-wood of Hæmatoxylon Campechianum.

Habitat.—The logwood tree, which attains a height of 30 or 40 feet, is indigenous to Central America, particularly to the shores of the Gulf of Campeachy. It is now naturalized in St. Domingo, Jamaica, and other West Indian islands.

Characters.—The logs as imported are from 3 to 4 feet long, heavy, and blackish purple or red externally, brownish red internally. Transverse sections present a series of concentric circles, alternating in colour. The wood is heavier than water. The chips have a reddish-brown colour, frequently marked with a peculiar beetle-green lustre due to hæmateïn. When chewed they tinge the saliva a brilliant dark pink colour. Taste sweet and astringent. The chips when warmed evolve an agreeable odour.

Composition.—Logwood contains a small amount of volatile oil; tannin; a fatty resinous body; and hæmatoxylin. Logwood readily parts with its colouring matter to boil-

Leguminosæ.

ing water, which on evaporation leaves the hard brittle extract.

Adulteration.—Brazil wood bears a strong resemblance to logwood. Brazil Wood contains a crystallizable colouring body, Brazilin, which gives red solutions instead of purple.

Therapeutics.—Astringent in certain forms of diarrhœa.

Used in the preparation of Dec. Hæmatoxyli and Ext. Hæmatoxyli.

No. 67. Tamarindus. *Tamarind.*

The preserved pulp of the fruit of Tamarindus Indica.

Habitat.—Indigenous throughout India and Africa. Naturalized in Brazil and Mexico.

Preparation.—The fully-ripened fruits are collected, and the brittle outer shell (epicarp) removed. In India this inner portion is pressed into a mass, to which a certain amount of sugar has been added. In the West Indies the pulpy portion is packed in suitable vessels, and boiling syrup poured over the mass. In Egypt the pressed cakes are dried in the sun.

Characters and Tests.—A reddish-brown, moist, sugary mass, enclosing strong branched fibres, and brown shining seeds, each enclosed in a tough membranous coat (endocarp). Taste agreeable, refreshing, subacid. A piece of bright iron, left in contact with the pulp for an hour, should not exhibit any deposit of copper.

Composition.—Tamarinds contain citric, tartaric, and malic acids, principally combined with potassium. Acetic acid is sometimes found, most likely resulting in the fermentation of the sugary mass. The testa of the seeds contains tannin. The pulp also contains pectin and mucilaginous matter.

Therapeutics.—Used as a mild laxative, and to quench thirst in cases of fever.

No. 68. Senna Alĕxandrina. *Alexandrian Senna.*

The dried leaflets of Cassia acutifolia (Cassia lanceolata).

sharp

Leguminosæ.

Habitat.—Upper Egypt, Nubia, Sennaar, and Kordofan.

Characters.—Cassia acutifolia is a low shrubby plant, about 2 to 3 feet high, with light-coloured erect or ascending branches. Leaves pari-pinnate, 4 or 5-jugate. Leaflets lanceolate, or oval-lanceolate, broad, unequal at the base, entire, thin, brittle, pale yellowish-green, and on the under surface very finely pubescent or nearly smooth. Odour peculiar, faint, tea-like ; taste, mucilaginous, nauseous, and sickly.

The leaflets of Cassia obovata are not now met with in commerce ; although this species is found in Arabia as well as Upper Egypt.

Collection.—The collection of senna leaves commences towards the end of September, after the rainy season. The inhabitants of the district first cut down the branches and allow them to dry by exposure to the sun, after which the leaves are stripped off by picking or beating the branches with a stick, and are then packed in bags, and shipped down the Nile to Cairo or Alexandria.

Alexandrian Senna, as imported, is of very variable quality, containing leaf-stalks, flowers, pods, and broken branches, a considerable admixture of the leaves of Solenostemma Argel, besides seeds, stones, and other rubbish ; considerable care is therefore taken in sifting and picking this drug. The addition of impurities sometimes amounts to 60 per cent. of the weight of the drug.

The only adulteration commonly met with is Solenostemma Argel (Asclepiadaceæ). This adulteration is only found in the Alexandrian variety of senna. The leaves have a strong resemblance to senna in shape, colour, and size, but differ by their thick and coriaceous texture, which renders the lateral veins almost indistinct ; they are equal at the base, surface wrinkled, colour greyish green, taste decidedly bitter.

Official Preparations.—Conf. Sennæ ; Mist. Sennæ Co. ; Syr. Sennæ ; Inf. Sennæ ; Pulv. Glycyrrhizæ Co. ; Tinct. Sennæ.

Leguminosæ.

No. 69. Senna Indica. *East Indian Senna.*

Synonym:—Tinnivelly Senna.

The dried leaflets of Cassia angustifolia (Cassia elongata).

Habitat.—This plant is found growing wild in Arabia and in Northern India. It is largely cultivated at Tinnivelly in Southern India.

Characters.—From about one inch to two inches in length, lanceolate, acute, unequal-sided at the base, thin, entire, yellowish-green and smooth above, somewhat duller beneath, and glabrous or slightly pubescent. In odour and taste very similar to Alexandrian Senna.

This Senna is always met with of a much better quality than the Alexandrian. It is never submitted to adulteration, and great care is exercised in collecting it.

The Bombay, East Indian, or Arabian Senna is obtained from the same species, but is collected from the wild plant, and with less care than the Tinnivelly Senna.

Composition of Senna.—Senna has yielded to different investigators a series of distinct principles, but it is only recently that the true active constituent of senna was isolated in the form of Cathartic acid, a body of complex composition, containing nitrogen and sulphur, and combined in the leaflets with magnesium and calcium, forming a colloid substance soluble in water and proof spirit, but not in strong alcohol.

Therapeutics.—Purgative.

No. 70. Cassiæ Pulpa. *Cassia Pulp.*

The pulp prepared from the recently-imported legumes of Cassia Fistula (Cathartocarpus Fistula).

Habitat.—A tree of about 50 feet in height; found indigenous to India, but is now cultivated in Tropical Africa, Egypt, Brazil, and the West Indian Islands.

Characters.—The legumes are from one to two and a half feet in length, and about one inch thick. The pericarp is woody, hard, of a blackish-brown colour, and indehiscent. The dorsal and ventral sutures are marked by two smooth longitudinal bands. Along the band of the dorsal suture there runs a fine ridge, while the ventral suture is marked by a shallow groove; internally the fruit is divided into a large number of loculi by thin, transverse, spurious, dissepiments (phragmata). Each loculus contains one seed, embedded in a blackish-brown, sweet pulp, which has a sickly odour and viscid consistency. This seed, unlike those of most leguminous plants, is albuminous.

Composition.—Cassia pulp contains a considerable amount of sugar, besides small quantities of acid tartrate of potassium, pectin and gum.

No. 71. Copaiba. *Copaiva or Copaiba.*

The oleo-resin obtained by cutting deeply, or boring into the trunk of Copaifera Langsdorffi and other species, of which the following may be mentioned :—Copaifera officinalis, C. Guianensis, C. coriacea. The Copaifera multijuga is a doubtful species.

Habitat.—Throughout Tropical South America and in some of the West Indian Islands.

Secretion.—Copaiva is contained in large resin passages in the wood of the stem, and is not found in the bark. The resin passages are supposed to arise from the solution of the cell-wall of several contiguous cells, but nothing definite is known on this point.

Collection.—The Indian, having selected a tree, cuts a large hole into the trunk at or near the base, and into this cavity the oleo-resin flows, and is removed from time to time, and poured into large leather bottles, in which it is carried to the sea-coast. It frequently happens that there will be no flow of balsam on first cutting the tree; if such is the case the cavity is plastered over with clay or any other suitable material, which is allowed to remain for some time, and then removed, and the oleo-resin collected. By this latter process an abundant flow is obtained. Old trees yield the oleo-resin two or three times a season, and it

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frequently exudes at the rate of from 10 to 12 pounds in three hours.

Characters.—A more or less clear and viscid liquid, generally transparent, in thin layers, but when examined in bulk it appears turpid or opalescent and faintly fluorescent; colour, pale brownish-yellow or very light yellow; having a peculiar aromatic odour; taste, somewhat bitter, and persistently acrid and nauseous. Its specific gravity varies from ·940 to ·993, and on keeping it becomes denser and thicker. When heated for some time it loses its volatile oil (which should not have a terebinthinate odour), leaving a resinous residue, which, when cold, is hard and pulverizable, and entirely soluble in glacial acetic acid, and is soluble in absolute alcohol, and in four times its volume of rectified spirit; insoluble in water, but soluble in carbon disulphide, volatile and fatty oils, ether, acetone, and in four times its bulk of petroleum ether, which solution should only give a faint deposit of resin on standing.

Composition.—Copaiva contains varying proportions of Volatile Oil, Copaivic Acid, Resins, and a bitter principle.

Volatile Oil. This is readily obtained by distilling the oleo-resin with an equal volume of water, and then separating the oil from that portion of the water which distils over with it.

Adulterations.—As copaiva has a variable composition, frequent advantage is taken of this to sophisticate the drug. Amongst the commoner additions fatty oils, turpentine, and gurgun oleo-resin are met with, and more rarely the oleo-resin of Hardwickia pinnata.

Fatty oils. The resin left after dissolving the oleo-resin is absolute alcohol, and, carefully evaporating in an open dish until it ceases to lose weight, should be hard and brittle, transparent, and easily reduced to powder; if fatty oil be present the resin will be soft and plastic, and if oils other than castor oil be present the residual resin will give a turbid solution with absolute alcohol. Castor oil is readily detected by the tests given by Flückiger and Hanbury, namely, agitate the oleo-resin with four times its weight of alcohol, warm, and on cooling decant the clear superstratum, evaporate to expel the alcohol and volatile oil (a sand bath for this purpose is preferable), mix the residue with soda lime, and heat, when the peculiar characteristic odour of œnanthol is recognized.

Turpentine is readily recognized by slowly heating a portion of the oleo-resin, when it may be detected by its odour.

If Gurgum oleo-resin is present the fluorescence of copaiva will be increased in proportion to the amount added.

70)

No. 72. Acaciæ Gummi. *Gum Acacia.*

A gummy exudation from the stem and branches of Acacia Senegal (A. Verek), and from other species, of which the following may be mentioned :—A. vera (arabica, nilotica), A. stenocarpa, A. tortilis, and A. Ehrenbergii.

Habitat.—The above species of Acacia are trees or shrubs found growing in Nubia, Abyssinia, Egypt, Senegambia, Kordofan, and Arabia.

Formation.—Gum Arabic, and other gums which are regarded as degradation products of the plant, most probably result from some physico-chemical metamorphosis of the cell contents, or of the wall of the cell, or, as others have considered, from the transformation of the starch granules, the quantity being increased by some abnormal condition of the tree.

Collection.—The gum exudes spontaneously from the axils of the branches, and the flow is considerably augmented by making deep incisions into the wood; but this latter process is seldom resorted to. The exudation is most plentiful during the summer months. It exudes as a thick liquid, which quickly hardens on the bark, and frequently falls off, or it is removed by means of a blunt knife or wooden mallet. The finest qualities of gum come from the upper districts of the White Nile.

Characters.—In roundish, ovoid, or vermicular tears, or masses of various sizes; or in angular fragments with glistening surfaces; colourless, or with a yellowish, brownish, or reddish tint. The tears are either opaque from numerous minute fissures, and very brittle, or more or less transparent and not readily broken ; the fractured surfaces are vitreous in appearance. Taste bland and mucilaginous ; without odour ; insoluble in alcohol, but entirely soluble in water, forming a clear mucilaginous solution. The aqueous solution forms with subacetate of lead an opaque white jelly. If an aqueous solution of iodine be added to the powder, or to a solution formed with boiling water and cooled, there is no appearance of a violet or blue colour.

Composition.—Gum Arabic contains about 15 per cent. of water, the residue being a compound of calcium and gummic or arabic acid, containing also a little potassium, magnesium, and phosphoric acid.

Gum, on incineration, leaves from 1·8 to 4 per cent. of ash, principally calcium carbonate.

The peculiar character that some varieties of gum arabic possess of merely swelling up or forming a ropy mucilage is not quite understood. By the prolonged action of heat such a mucilage in time becomes quite fluid ; a temperature of 80° F. is best for this purpose.

Other varieties of gum :—

1. Cape gum, generally of an amber colour ; brittle, and affording a weak mucilage.

2. Australian or Wattle gum is found in large tears of a reddish-brown colour, very tough, and breaks with a glassy fracture ; it forms a strongly adhesive mucilage. Quite recently large quantities of this gum have been imported into this country.

3. Senegal gum, used principally in France. It occurs in yellowish or brownish-red lumps, or often in elongated tears.

Used in the preparation of Mist. Cretæ, Mist. Guaiaci, Mucil. Acaciæ, Pulv. Amygdalæ Co., Pulv. Tragacanthæ Co., and in the Trochisci.

No. 73. Catechu Nigrum. *Black Catechu, Cutch.*

An extract prepared principally from the heart-wood of Acacia Catechu and Acacia Suma.

Leguminosæ.

Habitat.—Indigenous to the East Indies and Ceylon.

Manufacture.—The tree is cut down and chopped into small pieces. The chips are then placed in earthen jars arranged over a fireplace, and the jars filled with water and boiled for some time, the decoction being removed and more water added, and the boiling continued until the wood is exhausted; the decoction is now strained into a large earthen pot and evaporated down until it is sufficiently thick; it is then poured into clay moulds or into hollows covered with the large leaves of Dipterocarpus tuberculatus. After hardening, it is packed in boxes for shipping. It is principally imported from Pegu, in Lower Burmah and Calcutta.

Characters.—Cutch as imported is in large dark-brown masses, which are generally soft in the interior, but on drying it becomes hard and brittle; it breaks with an irregular, slightly porous, and granular fracture. It is almost entirely soluble in alcohol, with a slightly sweet but strong astringent taste. When carefully examined under the microscope, having previously moistened the powder with glycerine, it is seen to have a marked crystalline appearance. Occasionally it is imported in small round cakes, some varieties of which resemble lozenges, or in parallelograms technically known as "strips."

Composition.—Catechin, Catechu-tannic acid and Quercetin.

Impurities.—Cutch is frequently intermixed with broken twigs and leaves, which are best seen on breaking a sample.

No. 73a. Tonka Faba. *Tonquin Bean.*

The dried seeds of Dipteryx odorata.

Habitat.—Indigenous to Brazil and Guiana, where the trees grow to a height of 80 feet.

Characters.—The seeds are from one to two inches long, much wrinkled and two-edged. The testa is black, with a dull lustre, and frequently covered with minute crystals of coumarin; internally they are a light brownish-yellow in colour, and are easily separated into the two cotyledons; odour strongly aromatic; taste slightly bitter. The fruit resembles that of the almond tree.

Composition.—The principal constituent is the odorous principle coumarin; it also contains a fatty oil and a large quantity of proteids.

ROSACEÆ.

No. 74. **Rosæ Centifoliæ Petala.** *Cabbage Rose Petals.*

The fresh fully-expanded petals of Rosa centifolia.

Habitat.—Indigenous to Western Asia, largely cultivated in European countries. In England it is cultivated largely at Mitcham.

Characters.—The flowers are collected when full blown, and the calyx and ovaries carefully removed. The petals are large, thin, and delicate, with a retuse apex, nearly obovate; colour when fresh a pale pink, changing to light brown on keeping: odour fragrant and agreeable; taste slightly sweet and astringent, and faintly bitter.

Composition.—In composition the petals are almost identical with those of red rose. On distillation with water they yield a small quantity of an agreeable essential oil, and the aqueous distillate, after removal of the oil, retains the fragrant odour and sweetish taste of the petals.

Oleum Rosæ. *Oil of Rose, Otto (Attar) of Roses.*

The volatile oil distilled from the fresh flowers of Rosa damascena, and occasionally from other species.

Habitat.—Roses are largely cultivated throughout Southern and Eastern Europe, India, and Northern Africa, for the preparation of rose-water and otto.

Production.—The bulk of the otto of rose of commerce is imported from the Turkish provinces in Europe, being largely produced in Roumelia, Bulgaria, and throughout the Balkan Principalities, Kizanlik being the principal depôt. The shrubs are generally cultivated in rows, and the flowers collected early in the morning, and distilled the same day. The process of distillation is carried on in primitive copper stills, and the oil, as it swims on the surface of the distillate, is removed by a funnel-shaped tin vessel, or the distillate is re-distilled, and the first sixth that distils over removed and the oil separated. Otto of Roses, as generally imported from Constantinople, is contained in elaborate gilt bottles ; more recently considerable quantities have been met with in kunkumas or flattened round tinned copper flasks, containing from 1 lb. to 12 lbs. of oil ; the flasks are covered with a thick woollen fabric bearing numerous seals. During the last two or three years, otto has been imported in quantity from the south of France, of very good quality.

Characters.—Otto of Rose is of a pale yellow colour, transparent, but when the temperature is gradually lowered it solidifies into a semi-transparent mass, consisting of light brilliant scale-like crystals, which, on rapid cooling, crystallize in the form of feathery prisms.

Composition.—Otto of Rose consists of an elæoptene or fluid oil, which is an oxygenated body, to which it entirely owes its perfume; it is readily soluble in spirit; and a stearoptene or solid hydrocarbon, which is inodorous.

Adulterations.—Otto of Rose is extensively adulterated, and amongst the more commonly occurring substitutes are Turkish oil of geranium, or oil of gingergrass; this oil is generally bleached prior to use ; oil of rose geranium and oil of rhodium ; this oil has a pungent bitter taste. All of these oils have a marked acid reaction, true otto being neutral. Fatty oils, such as almond oil, are frequently added to otto to keep it permanently fluid.

No. 75. **Rosæ Gallicæ Petala.** *Red Rose Petals.*

The fresh and dried unexpanded petals of Rosa gallica.

Habitat.—Indigenous to the Levant and Southern Europe. Cultivated on a large scale at Wassenaar and

Noordwijk in the Netherlands, at Mitcham and other districts in England, also in Germany and France.

Characters.—Usually in small, cone-like masses, sometimes separate and more or less crumpled; when opened out the petals are roundish, with a retuse apex, and a short yellow claw; fine purplish red, which does not fade on drying and keeping, velvety in aspect; odour fragrant, roseate; taste somewhat bitter, slightly acid and astringent.

Collection.—Red Rose petals are generally gathered while the flower is still unexpanded; they are carefully snipped off by means of scissors, leaving the short claw attached to the calyx; they are then immediately dried by means of a warm stove, and afterwards gently shaken in sieves to free them from adhering stamens.

Composition.—A characteristic colouring matter, quercitrin, gallic acid, sugar, and fat.

Adulteration.—About five years ago a considerable amount of artificially-coloured rose petals was shipped to London from Hamburg, but the fraud was soon recognized. The petals were coloured with a solution of rosaniline, and when treated with proof spirit gave a deep crimson solution.

Used in the preparation of Confectio Rosæ Gallicæ, Infusum Rosæ Acidum, and Syrupus Rosæ Gallicæ.

No. 76. Rosæ Caninæ Fructus.

Fruit of the Dog Rose. Hips.

The ripe fruits of Rosa canina and other indigenous allied species.

Habitat.—Indigenous.

Characters.—The fruit (a cynarrhodum) is about three-quarters of an inch or more in length, and consists of an enlarged and succulent calyx tube, ovoid or somewhat oval, smooth, shining, scarlet or red, and containing inside a large number of seed-like fruits (achenes), which are covered with minute hairs. Inodorous and fleshy; taste agreeable, sweetish, and acidulous.

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Composition.—Citric acid, malic acid, sugar, gum, and traces of resin.

Used in the preparation of Conf. Rosæ Caninæ (Confectio Cynosbati).

No. 77. Tormentillæ Rhizoma. *Tormentil.*

(Not official.)

The dried rhizome of Potentilla Tormentilla.

Habitat.—Indigenous to Europe and Northern Asia.

Characters.—The rhizome is generally from two to three inches long, irregularly cylindrical, and sometimes divided, thick, and externally marked by numerous protuberances; externally of a reddish-brown colour, internally generally of a deeper tint; fracture brittle and slightly resinous; inodorous, taste persistently astringent.

Composition.—Tormentil contains nearly 30 per cent. of tormentil-tannic acid and about 20 per cent. of tormentil red, closely allied to rhatany-red; it also contains small quantities of kinovic and ellagic acids, resin, and mucilage.

Therapeutics.—Astringent.

No. 78. Cusso. *Kousso.*

The dried panicles (principally of the female flowers) of Hagenia Abyssinica (Brayera anthelmintica).

Habitat.—A large tree found in the mountainous districts of Abyssinia.

Characters.—The flowers occur in long panicles, and are unisexual; and although both female and male (monœcious) occur in the same tree, the former is chiefly collected. Kousso occurs in compressed clusters, or more or less cylindrical rolls about one foot in length, or the panicles are broken into small fragments, varying in colour from brown, greenish-brown, to reddish in the female flowers. Odour herby, tea-like; taste bitter, acrid, and disagreeable. The separate panicles are much branched, and zigzag;

generally covered with hairs and glands, and at the base of each branch there is a large sheathing bract. Flowers numerous, small, unisexual, with a membranous bract at the base of each flower. The calyx is hairy externally.

Red Kousso consists entirely of female flowers; it is chiefly imported by way of Aden and Bombay.

Composition.—Koussin, tannin, wax, gum, and sugar.

Therapeutics.—Anthelmintic.

Dose $\frac{1}{4}$ to $\frac{1}{2}$ ounce.

Official Preparation.—Inf. Cusso.

No. 79. Cortex Pruni Serotinæ. *Wild Cherry Bark.*

(Not official.)

The bark of Prunus serotina, from which the outer suberous layer has been removed.

Habitat.—A large tree growing throughout the North American Continent, generally about sixty feet high.

Characters.—The bark is collected from the trunk and branches, and occasionally from the root. As met with it occurs in irregular, flat, or channelled pieces, varying from $\frac{1}{2}$ to 2 inches broad, and about 6 inches long: the smaller and thinner pieces are obtained from the branches; they are frequently covered with a thin papery external covering, marked with numerous scars, and the surface is smooth and shining. The inner surface is finely striated, and of a reddish or cinnamon-brown colour. In the older pieces, from which the suberous layer has been removed, generally by shaving, it is somewhat irregular and rough, and of a rusty brown colour. The bark breaks with a brittle and granular fracture. It has little or no odour when dry, but on macerating in cold water for a time it develops the odour of the volatile oil of bitter almonds. Taste aromatic, bitter, and astringent, followed by that of bitter almonds.

Composition.—Wild Cherry bark contains a bitter principle, amygdalin, and a proteinaceous body, resembling emulsin; it also contains a little gallic acid, resin, and about 4 per cent. of a tannin.

Substitute.—The bark of this species has been frequently mistaken for that obtained from the Prunus Virginiana.

No. 80. Fructus Pruni. *Prunes.*

The dried drupe of Prunus domestica, var. Juliana.

Habitat.—The plum tree is indigenous to Western Asia, particularly the shores of the Black Sea and Northern Persia; it is also found wild in Greece. The medicinal prunes obtained from the above variety are principally cultivated in France, in the Loire district.

Characters.—The dried drupe is ovoid or oblong, about one inch and a quarter long; of a black or dark purple colour; glaucous, shrivelled, and having a longitudinal furrow. The sarcocarp is brownish, without marked odour; and the putamen smooth, slightly flattened, hard, and oblong; ridges irregular. The sarcocarp, which is the portion used in medicine, has a sweetish sub-acid agreeable taste. The seeds, when removed and submitted to pressure, yield 20 per cent. of a bland yellow oil.

Composition.—Sugar, mucilaginous matter, pectin, malic acid, and albuminoid substance. The proportion of sugar varies from 14 to 34 per cent. of the weight of the fruit.

Substitutes.—As there are different varieties of the Prunus domestica, their fruits are collected; the German prune has a much thicker epicarp, and the fruit is more elongated.

No. 81. Amygdala Amara. *Bitter Almond.*

The ripe seed of the Bitter Almond Tree, Prunus Amygdalus, var. amara (Amygdalus communis, var. amara).

Habitat.— The almond tree is found growing throughout Asia Minor and Persia; but its true habitat has never been thoroughly ascertained. It is cultivated in Southern Europe and Algeria, and other North African countries.

Rosaceæ.

Characters.—The fruit is a drupe, ovate in form, and from 1 to 2 inches long, and about 1½ inch broad, with a velvety sarcocarp, which is of a white colour, and which splits at maturity, and then falls off, leaving naked, and still attached to the stalk, the putamen, containing the seed which constitutes the commercial almonds. The putamen is oblong, ovate, and pitted with irregular holes; it is brittle, and breaks easily, exposing the elongated seed.

The seed is covered with a cinnamon brown scurfy testa, pointed at its upper end, and rounded at the other extremity, presenting a blunt appearance, the testa firmly adherent to the pale coloured tegmen, both of which are easily removed on macerating the seeds in water, leaving the white embryo. The hilum is found at the pointed end, and situated on the edge of the almond, from which runs the raphe, terminating at the rounded end in the chalaza, which divides into a number of fine lines running towards the pointed upper end. The seed is composed of two cotyledons, white and oily; between the cotyledons, and situated at the pointed and basal end, is seen the small plumule and radicle, the latter slightly projecting. Bitter almonds are inodorous, but when chewed have a bland nutty flavour, quickly changing to a bitter taste, and a flavour resembling that of ratafia or peach kernels.

Bitter almonds are also distinguished from sweet almonds by being more frequently angular, from the mutual pressure of two occurring in the same putamen.

Varieties.—There are several commercial varieties of bitter almonds, generally distinguished by the name of the country from which they are imported, namely, French, Sicilian, and Barbary.

Composition.—From 45 to 50 per cent. of fixed oil, of which 43 per cent. can be obtained by expression; and about 7 per cent. of cane-sugar. They also contain two proteinaceous substances, Amandin, Emulsin or Synaptase, and a characteristic glucoside, Amygdalin.

Amandin and Emulsin. These proteinaceous bodies are extracted from the bitter almond cake after removal of the oil by expression, and the amygdalin by alcohol; the residual cake is macerated in cold water, and then filtered, the filtrate carefully evaporated to one-third its original volume, and acetic acid added, which precipitates the amandin. This is collected on a filter, washed with water containing a little acetic acid, and then carefully dried. To the filtrate containing the emulsin alcohol is added, and the precipitated emulsin is collected. Emulsin seems to be the principal agent in decomposing the amygdalin and in emulsifying the fatty oil.

Amygdalin. This crystalline body is best prepared from the seeds after they have been freed from the fatty oil, by exhausting with boiling alcohol, filtering, and allowing the liquid to stand, when it crystallizes in prisms. It is afterwards purified by washing with ether and recrystallizing from boiling alcohol. Bitter almonds yield about 3 per cent. of amygdalin.

Essential Oil of Bitter Almonds. The bitter almond cake, after expression of the fatty oil, is broken up and macerated with five or six times its weight of water, at a temperature of 120° F., for about twenty-four hours; too high a heat must be avoided, otherwise the albuminoid ferments will become coagulated, and cease to act. The yield of essential oil is very variable, due to the different kinds of almonds, but ranges from ·8 to 2·8 per cent.

Essential Oil of Bitter Almonds is a colourless liquid, with an aromatic odour, and an acrid, burning taste, and when freshly prepared smells strongly of hydrocyanic acid. Specific gravity, 1·06, and when freed from acid, 1·049. It is readily soluble in ether and alcohol. The oil, when first prepared, always contains variable quantities of hydrocyanic acid, and when freed from it consists entirely of pure benzaldehyd.

Purification of the oil. Various processes have been used in removing the hydrocyanic acid; such as solution of sodium acid sulphite, freshly precipitated mercuric oxide, and a mixture of ferrous sulphate and slaked lime; the latter is the one generally employed. The ferrous sulphate and slaked lime are intimately mixed, and placed in the still, the oil is added, and the whole stirred, and left to stand some time, and finally distilled with superheated steam (Eck), and the oil collected. This method occasions a loss of about 10 per cent., and the oil afterwards is very prone to oxidation, being converted into benzoic acid.

Adulteration.—The volatile oil is frequently liable to adulteration with nitrobenzol or oil of mirbane, alcohol, and chloroform. The two latter can be detected by distilling at a low temperature, when they will pass over, leaving the oil. Various methods can be used for the detection of nitrobenzol; the following two give good results: add a drop or two of the oil to a solution of potassio-stannous chloride, and afterwards a drop of carbolic acid, and finally a little solution of chlorinated soda, when the blue colour of sodium erythrophenylate is produced (Jacquemin); or dissolve the oil in alcohol, and then add some hydrochloric acid and a few strips of zinc; after the action ceases add one-third its volume of ether and agitate, decant the ethereal layer, allow it to evaporate, then add a little solution of chlorinated lime, when a purplish blue colour will appear. (Hoffman.)

Official Preparation.—Oleum Amygdalæ.

No. 82. Amygdala Dulcis. *Sweet Almonds.*

The ripe seed of the sweet almond tree, Prunus Amygdalus, var. dulcis (Amygdalus communis, var. dulcis).

Habitat.—Similar to the Bitter Almond tree.

Varieties.—They are largely cultivated in the Balearic Isles, and are principally exported *viâ* Valencia and Italian and French ports. The cultivation in Spain is carried on to a considerable extent; and the best almonds are exported from Malaga and known as Jordan almonds. This variety is particularly ordered in the Pharmacopœia; the putamen of this variety is hard and brittle. The soft-shelled almonds are mainly obtained from Prunus Amygdalus, var. fragilis. The commercial names for the varieties are Jordan, Valencia, Sicilian, and Barbary.

Characters.—Sweet Almonds are botanically identical with the bitter, but differ in generally being longer and narrower, with a sweet, bland, nutty flavour, which does not become bitter, and the white emulsion does not acquire any marked odour on standing.

Composition.—Sweet Almonds possess qualitatively the same composition as the bitter, with the exception that they contain no amygdalin and a relatively larger proportion of fixed oil, viz. 56 per cent.

Almond Oil is obtained from both bitter and sweet almonds. They are first agitated to remove adhering dust, then crushed and placed in canvas bags and submitted to pressure by the hydraulic press, when 50 per cent. of oil is obtained; frequently they are pressed between warm steel plates, but a lower yield of oil is obtained in this way. The oil is of a pale straw-yellow colour, thin and nearly inodorous, with a bland oleaginous nutty taste; soluble in ether, benzine, and chloroform. On exposure to the air it rapidly changes, becoming rancid, and the odour rank and disagreeable. It is nearly pure olein, with a minute quantity of palmitin, and is closely related to olive oil.

Official Preparations.—Ol. Amygdalæ, and Pulv. Amygdalæ Co.

No. 83. Lauro-cerasi Folia. *Cherry-Laurel Leaves.*

The fresh leaves of Prunus Lauro-cerasus.

Habitat.—Persia and Asia Minor, naturalized in Southern Europe, and cultivated in England as an ornamental shrub.

Characters.—The leaves are thick, coriaceous, glossy, on strong short petioles, oblong or slightly obovate, five to seven inches long, and tapering towards the extremities; apex recurved, revolute at the margins, which are distinctly but sharply serrated, dark green above, paler beneath, with a prominent midrib, on either side of which, near the base, are two to four glandular depressions. The fresh leaves unbroken are inodorous, but on bruising develop a ratafia-like odour; taste slightly astringent, aromatic and bitter. The best time to collect the leaves is during July and August.

Rosaceæ.

Composition.—Cherry-Laurel leaves contain a principle closely related to amygdalin, which is called lauro-cerasin; they also contain emulsin, malic acid, tannin, and wax.

When the leaves are chopped fine and macerated in water and then distilled, the distillate contains the volatile oil of bitter almonds and hydrocyanic acid; the official preparation is supposed to contain ·1 per cent. of the latter; from a number of samples examined the highest percentage obtained was ·075, and the lowest ·063; it is an extremely unstable preparation.

Therapeutics.—The same as hydrocyanic acid.

Official Preparation.—Aqua Lauro-cerasi.

No. 83a. **Quilliaiæ Cortex.** *Soap Bark.*

(Not official.)

The prepared and dried inner bark of Quilliaia Saponaria.

Habitat.—Indigenous to Chili and Peru.

Characters.—As met with in commerce the brown suberous layer is removed, and it occurs in long flat pieces with an occasional patch of the corky layer adherent; externally it is a light reddish-yellow, and internally of a light yellow colour, fracture splintery, and the dust has a powerful sternutatory effect; taste acrid, and its aqueous infusion froths copiously on agitation.

Composition.—The bark contains saponin, calcium sulphate, and starch.

Use.—A decoction is largely used as an emulsifying agent, and in place of soap for cleaning delicate fabrics, such as fine lace, &c.

No. 84. **Semen Cydoniæ.** *Quince Seed or Pips.*

(Not official.)

The dried seeds of Cydonia vulgaris (Pyrus Cydonia).

Habitat.—Indigenous to Asia Minor and Persia, natural-

Myrtaceæ.

ized in the countries bordering on the Mediterranean Sea; cultivated in America.

Characters.—The fruit, which is sub-globular or pyriform, has a golden-yellow colour and powerful odour, with a strong astringent taste while unripe. Botanically it differs from an apple in having numerous seeds arranged in two rows in each loculus, an apple having only two seeds in each. Quince seeds are oval or oblong in form, and by mutual pressure flattened and three-sided; the hilum is at the lower pointed end, from which the raphe runs as a straight ridge to the other end; the testa is of a mahogany-brown colour, covered with a mucilaginous epithelium. The kernels when bruised and steeped in water evolve the odour of hydrocyanic acid.

Composition.—Quince Seeds when thoroughly exhausted with water yield nearly 20 per cent. of dry mucilage, and one part of seeds will readily gelatinize thirty parts of water.

Therapeutics.—The pulp and rind possess an astringent character, and are used in cases of hæmorrhage.

MYRTACEÆ.

No. 85. Carophyllum. *Clove.*

The dried unexpanded flower-bud of Eugenia caryophyllata (Caryophyllus aromaticus).

Habitat.—The Clove tree is strictly indigenous to the Molucca Islands, but is now almost destroyed in those districts. It is largely cultivated in the East Indian Islands, Zanzibar, South America, and the West Indies.

Collection.—As soon as the flower-buds of the corymbose inflorescence alter in colour from green to brownish-red, the branches are beaten with sticks, when the flower-buds, from the peculiar jointed character of the short stalks supporting them, fall off, or the flower-buds are carefully picked by hand; this latter method being the one adopted in Zanzibar. The cloves are then spread out on sheets or bamboo trays, and dried by exposure to the sun. The collection is carried on twice a year, in the months of June and December. The best cloves are imported from Zanzibar and the Moluccas.

Characters.—The flower-bud of the clove tree consists of an elongated, nearly cylindrical calyx, solid, of a reddish-brown colour, and somewhat wrinkled, divided at the top into four limbs, clasping the imbricate corolla, which forms a rounded head of a lighter colour, enclosing numerous stamens arranged in four bundles. The ovary is situated near the top of the calyx-tube, and is two-celled, and contains numerous ovules, the style projecting upwards as a fine point. The clove varies from half to three-quarters of an inch in length; odour strong and fragrant; taste aromatic, warm, and pungent. When indented with the finger-nail it emits minute drops of oil; the oil is contained in irregular circles of oil ducts or cells, which are situated just beneath the epidermis of the calyx.

Composition.—Caryophyllin and Eugenin and volatile oil.

The volatile oil is generally obtained by distilling with superheated steam, the cloves being first well bruised; or they may be distilled with water to which salt has been added to increase the boiling point. The oil is almost colourless, or of a pale straw colour; on keeping it darkens and becomes more viscid, possessing in a marked degree the odour and taste of the clove; it sinks in water, the specific gravity varying from 1·035 to 1·055. It is soluble in alcohol, and the solution gives a purple colour on the addition of ferric chloride. Cloves yield from 14 to 20 per cent. of volatile oil, of which eugenol comprises about 70 per cent. The oil is also obtained from the clove stalks, which yield about 5 per cent.

Adulteration.—Occasionally cloves are submitted to adulteration, and for this purpose cloves from which the volatile oil has been removed are used. They are easily recognized by being soft and moist, the globular corolla being usually absent; they also have a very faint odour, and no sharp pungent taste. Clove stalks are sometimes found in samples of cloves, the result of careless picking; they are slightly branched, and of a light colour, and

Myrtaceæ.

possess the characteristic clove odour and taste. The inferior fruit or berries known as mother cloves are occasionally met with in commerce: they are covered with the persistent calyx, and usually contain two or three seeds, and are about one inch in length. They also, like all parts of the clove tree, possess a pungent and aromatic taste.

Therapeutics.—Aromatic and carminative.

Official Preparations.—Inf. Aurantii Co.; Inf. Caryophylli; Mist. Ferri Aromat.; Ol. Caryophylli; Vin. Opii.

No. 86. Pimenta. *Pimento.*

Synonym:—Allspice, Jamaica Pepper.

The dried, unripe, full-grown fruit of Pimenta officinalis (Eugenia Pimenta).

Habitat.—The tree is indigenous to the West Indies and Central America; but the island of Jamaica supplies the bulk of that which is imported.

Collection.—The Allspice trees are usually planted in rows, called Pimento walks, and require very little attention. The flowers are rapidly succeeded by the berries, and these after attaining their full size, but still unripe, are removed, and spread out, and dried by exposure to the sun and air. They are frequently assorted according to size by shaking them through sieves of different degrees of fineness.

Characters.—Pimento consists of the nearly globular fruit, about $\frac{1}{5}$ of an inch in diameter, and crowned at the apex with the remains of the calyx in the form of a scar-like ring. Pericarp rough from the presence of oil glands, brittle, and of a reddish-brown colour, internally lighter, woody, two-celled, each containing a brown, roundish, reniform seed. Odour and taste warm, aromatic, resembling that of cloves.

Composition.—Pimento contains a volatile oil, an alkaloid, tannic acid, resin, and starch. The Volatile Oil, which is obtained by bruising the fruit and distilling with steam, separates as a pale yellow oil, becoming brown on keeping; it sinks in water. Specific gravity, 1·037.

Therapeutics.—Stimulant and carminative.

Official Preparations.—Aqua Pimentæ, Oleum Pimentæ.

No. 87. Oleum Cajuputi. *Oil of Cajuput.*

The oil distilled from the leaves of Melaleuca minor (Melaleuca Cajuputi).

Habitat.—Indigenous to the East Indian Islands; but the oil is mainly obtained from the islands of Celebes and Bouro.

Preparation.—The leaves are collected and chopped up, then allowed to undergo fermentation, after which the oil is obtained by distillation. By allowing the leaves to undergo fermentation a greater yield of oil is obtained.

Characters.—Oil of cajuput is a transparent, limpid, volatile, pale bluish-green liquid, with a powerful, agreeable, camphoraceous odour, and a warm, bitterish, camphoraceous, afterwards cooling taste. Specific gravity from ·914 to ·930. Readily soluble in alcohol, fixed oils, and ether. On redistilling the oil it becomes colourless.

Composition.—The oil consists principally of cajuputene.

The peculiar bluish-green colour of the oil is mainly due to minute traces of copper; but there are certain oils derived from other species, which have a natural green hue, which becomes fainter on keeping.

Adulteration.—Turpentine oil is sometimes met with in samples of this oil. The presence of this adulterant renders the oil much less soluble in alcohol, and when treated with iodine violent action takes place, whereas cajuput oil has only a faint action with iodine.

Therapeutics.—Stimulant and antispasmodic.

Official Preparations.—Lin. Crotonis; Sp. Cajuputi.

No. 88. Eucalyptus. *Eucalyptus Leaves.*

The leaves of Eucalyptus globulus.

Myrtaceæ.

Habitat.—This important genus is found throughout Australia and Tasmania. Several members have been introduced to the South of Europe, where they grow to large size.

Characters.—There are two varieties of leaves. Those obtained from the young plant are short, opposite, oval or oblong, and of a pale bluish-green colour, covered with a whitish waxy bloom. The other variety is obtained from older plants. They are lanceolate, oblique at the base, and tapering to a fine point at the apex; texture coriaceous; colour greyish-green; midrib prominent, from the base of which, running towards the apex, are seen two well-developed lateral veins. Throughout the mass of the leaf there are numerous pellucid oil ducts. Odour camphoraceous, taste warm, aromatic, and slightly bitter, followed by a sensation of coldness.

The flowers, which are frequently met with amongst the leaves, are liable at first to be mistaken for fruits. The calyx is united and woody, top-shaped, rough and warty, and covered with a peculiar whitish bloom. The upper portion is firmly connected with the corolla, forming the so-called operculum, which is in the form of a cone, and easily removed. Situated in a disc on the calyx are numerous yellow stamens. The ovary is firmly united to the calyx tube, and is five-celled.

Composition.—The leaves yield variable quantities of a volatile oil; they also contain tannin, a crystalline fatty acid, and resin.

Oleum Eucalypti, *Eucalyptus Oil.*—The oil distilled from the fresh leaves of Eucalyptus globulus, Eucalyptus amygdalina, and other species of Eucalyptus.

Preparation.—The leaves, and frequently the young twigs, are collected, and then submitted to distillation with water, and the light oil which separates from the aqueous distillate siphoned off. It is then allowed to stand in contact with calcium chloride to remove the last traces of water. As various species of Eucalyptus are utilized in preparing the oils, there necessarily exists considerable difference in their colour, odour, and specific gravity.

Myrtaceæ.

Characters.—The volatile oils are of a pale or dark yellow colour, and sometimes colourless; these mobile fluids becoming darker in colour and thicker by age. Taste aromatic, pungent, and camphoraceous in the case of E. globulus, slightly resembling peppermint in that of E. amygdalina; whilst that yielded by the other species is more or less terebinthinate. An oil of a specific gravity above ·880 should be soluble in its own weight of rectified spirit, and should dissolve not less than one-tenth of its weight of salicylic acid. That of a specific gravity below ·880 should not require more than six volumes of rectified spirit for complete solution, and should dissolve one sixteenth of its weight of salicylic acid. (Mac Ewan.) Generally the darker oils are the best.

Composition.—Oil of Eucalyptus varies in its composition, according to the source from which it is obtained. The oil of E. globulus contains about 60 per cent. of a terpene, eucalyptene, about 30 per cent. of cymene, and an oxygenated hydrocarbon called eucalyptol.

Adulteration.—Turpentine oil, if present in eucalyptus oil, will diminish its solubility in alcohol.

No. 89. Granati Radicis Cortex. *Pomegranate Root Bark.*

The dried bark of the root of Punica Granatum.

Habitat.—Indigenous to Palestine and Asia Minor; cultivated to a considerable extent in the south of Europe.

Characters.—The bark occurs in quills from 3 to 6 inches in length, or in fragments, externally of a brownish grey colour, marked with corky ridges or warts, or cracked, with faint longitudinal striæ and depressions, internally of a reddish yellow colour, smooth, having a short fracture and a greenish yellow colour; no odour, but a bitter and astringent taste.

An infusion gives a black colour on the addition of ferric chloride.

Composition.—Pomegranate Root Bark contains tannic acid, mannitol, and an alkaloid named Pelletierine.

Cucurbitaceæ.

Adulterations.—Box and Barberry barks are used sometimes to adulterate it; they are distinguished by having a bitter taste, and are destitute of astringency.

The rind of the fruit is frequently substituted; it occurs in flattish pieces, of a reddish-brown colour externally, and internally of a lighter colour, marked with numerous depressions caused by the seeds, some of the pieces having a portion of the toothed calyx adherent.

Therapeutics.—Vermifuge.

Official Preparation.—Decoctum Granati Radicis.

No. 90. Myrti Fructus. *Myrtle Berries.*

(Not official.)

The dried ripe berries of Myrtus communis.

Habitat.—A native of Western Asia. The myrtle has now become naturalized to Southern Europe.

Characters.—The fruit is a sub-globular, fleshy, purplish black berry about the size of a pea, two-celled, each cell containing four small seeds reniform in shape; odour agreeable, taste sweetish and subacid.

Composition.—The fruit contains citric and malic acids, sugar, tannin, and a little resin and volatile oil.

The flowers and leaves distilled with water yield the fragrant *Eau d'ange.*

Therapeutics.—Aromatic and astringent.

CUCURBITACEÆ.

No. 91. Colocynthidis Pulpa. *Colocynth Pulp.*

The dried peeled fruit, freed from seeds, of Citrullus Colocynthis. There are three commercial varieties, viz. Turkish, Spanish, Mogador, the latter unpeeled. The Turkish variety affords more pulp in proportion to the seed.

Habitat.—The colocynth plant is met with in several countries in Asia, including India, Japan, Persia, and Asia Minor, and abundantly in the South of Europe and Northern Africa.

Characters.—The fruit, which is a pepo, is about the size and form of a large orange, covered with a thin parchment-like rind of a light brown colour, which is removed by slicing or scraping. As imported it is in roundish balls, more or less broken, colour white, very light, spongy, tough, and consisting of the pulp in which the seeds are imbedded. The pulp when freed from the seeds is without odour, but possesses an intensely bitter taste.

The fruit consists of about 25 per cent. of pulp and 75 per cent. of seeds, which contain 17 per cent. of fixed oil.

Composition.—Colocynth contains a glucoside colocynthin, to the extent of $\frac{1}{4}$ per cent. only, and pectin, mucilaginous and gummy matter.

Adulteration.—Frequently the seeds are powdered and mixed with the pulp; such an addition is best detected by percolating the pulp with benzine and allowing the percolate to evaporate, when an oily residue will be left if the seeds are present, also by the amount of ash, the pulp affording 11 per cent., and the seeds only 2·7 per cent.

Therapeutics.—A drastic purgative.

Official Preparations.—Ext. Colocynthidis Co.; Pil. Colocynthidis Co.; Pil. Colocynthidis et Hyoscyami.

No. 92. Elaterium. *Elaterium.*

Synonym:—Extractum Elaterii.

A sediment from the juice of the squirting cucumber. Ecballium Elaterium (Ecballium officinarum).

Habitat.—Indigenous to Southern Europe and Asia Minor. Cultivated at Hitchin and Mitcham, also in France.

Description.—The Squirting Cucumber is a coarse, hispid plant, decumbent in its habit, throwing up a thickened succulent stem to a height of about 2 feet, bearing coarse triangular leaves and unisexual flowers. The fruit is an ovoid pepo, about two inches in length, studded with a number of short prickles, and hangs from a recurved stalk; it is of a pale green colour, three-celled, and contains numerous seeds, immersed in a thin mucilaginous juice having a bitter taste. When the fruit ripens, which is generally about September, it separates suddenly from the stalk, discharging at the same time the numerous light brown seeds and the watery juice surrounding them.

Preparation of Elaterium.—The nearly ripe fruits are carefully collected and then cut lengthwise, and the juice, obtained by gently pressing the portions. Sometimes the contents are gouged out with the thumb, and the whole thrown on a hair-sieve and washed with a little water. The muddy liquid is set aside for some time, and then the clear supernatant liquid decanted; the sediment is then poured on a linen cloth and allowed to drain, then dried on porous tiles exposed to the sun's heat or in a drying closet. This process is the one recommended by Dr. Clutterbuck in 1820. The fruits afford about 0·123 per cent. of elaterium.

Characters.—Elaterium occurs in light friable flat or slightly curved opaque cakes, about one-tenth of an inch thick; pale green, greyish-green, or yellowish-green. according to age; fracture finely granular; odour faint, tea-like; taste bitter and acrid. It does not effervesce when treated with mineral acids; boiled with water and the decoction cooled, the addition of iodine affords little or no blue colour; when treated with rectified spirit it should give up about one-half its weight. Maltese Elaterium occurs in pieces nearly twice as thick as the English kind, and is less active.

Composition.—Elaterium contains a characteristic principle Elaterin, pectin, and gummy substances.

Determination of Elaterin.—Finely powder a weighed quantity of Elaterium, and intimately mix it with twice its weight of finely-powdered pumice or washed sand, then pack in a small percolator and pass chloroform through the mixture until a drop evaporated on a watch-glass leaves no appreciable residue ; recover the chloroform from the dark-green percolate by distillation, then wash the residue with anhydrous ether, until the washings are free from colour, and carefully dry it on a water-bath and weigh. The process recommended by the Pharmacopœia of adding ether to the chloroformic solution does not completely precipitate the Elaterin. A sample of Maltese Elaterium gave by the above process 23 per cent. of Elaterin; good English Elaterium should yield about 30 per cent.

Therapeutics.—A powerful hydragogue cathartic.

Dose $\frac{1}{16}$ to $\frac{1}{2}$ grain.

Official Preparation.—Pulvis Elaterini Co.

No. 92a. Bryony.

(Not official.)

The dried roots of the Bryonia dioica and Bryonia alba.

Habitat.—Indigenous. Named in allusion to the quick growth of the stems, from *bryo*, to sprout.

The root is powerfully purgative, but, if properly cooked, becomes wholesome. It bears some resemblance to Calumba root, for which it is sometimes mistaken. Black Bryony is a monocotyledon and belongs to the natural order Dioscoreaceæ. Although it is a monocotyledon, the leaves have reticulated venation.

UMBELLIFERÆ.

No. 93. Conii Folia. *Hemlock Leaves.*

The fresh leaves and young branches of Conium maculatum.

Habitat.—Indigenous throughout Europe and Northern Africa, naturalized in certain districts in America.

Characters.—Spotted Hemlock is a biennial plant, and during the first year produces only a small tuft of leaves ;

during the second year the stem increases in size, ultimately reaching a height of five or six feet. The lower leaves found on this stem are the largest, having a sheathing petiole which is more or less hollow. They are much divided, broadly ovate in outline and pinnately decompound; the pinnæ being oblong-lanceolate, the upper ones toothed and each lobe terminating in a white point, the entire leaf varying from one to two feet in length. The upper leaves are much smaller and less decompound, the petioles being almost absent. When fresh the leaves are of a dark green colour, lighter beneath, and on drying change to a greyish-green colour. Odour strong and disagreeable, resembling the urine of mice, increased on addition of solution of caustic potash. The lower portion of the stem is marked with numerous purplish spots, and at the base of the petioles there is a long reddish line.

Composition.—Hemlock Leaves lose on drying about 80 per cent. by weight. They contain a minute quantity of conine, which is combined with malic acid ; it is contained in the juice obtained by expressing the leaves. The leaves on incineration leave about 12 or 13 per cent. of ash.

Æthusa Cynapium, Fool's Parsley, is a common weed, which may be distinguished from hemlock by the absence of the general involucre and by the long pendant involucel of three bracts on each partial umbel. The leaves resemble those of hemlock in outline and subdivision, but when bruised emit a disagreeable fœtid alliaceous odour, and the ridges on the fruit are devoid of the wavy outline characteristic of Hemlock fruits.

Therapeutics.—Sedative and resolvent.

Official Preparations.—Extractum Conii. Succus Conii.

No. 94. Conii Fructus. *Hemlock Fruit.*

The fruit of Conium maculatum, gathered when fully developed, but while still green, and carefully dried.

Conium fruits, as met with, have generally become separated into their component mericarps. Each mericarp is about one-eighth of an inch long, slightly compressed laterally, having a convex outer surface, marked with five crenate or wavy ridges, the intervening furrows being devoid of vittæ. Colour, grey-green or greyish.

Composition.—Hemlock fruits contain conine and its derivatives, methylconine and conhydrine, with small quantities of fatty and volatile oils, the latter closely resembling that of cumin; and malic and acetic acids.

Therapeutics.—Sedative.

Official Preparation.—Tinctura Conii.

No. 95. Ajowan Fructus. *Ajowan, True Bishop's Weed.*

The dried ripe fruits of Carum Ajowan (Ptychotis Ajowan, Ammi Copticum).

Habitat.—India; cultivated in Persia and Egypt.

Characters.—Ajowan Fruits are very small, greyish-brown in colour, rough on the external surface; the taste is spicy and aromatic; when bruised, they exhale the odour of thyme. Each mericarp has five ridges, with a corresponding number of vittæ.

Composition.—When distilled, the fruits yield about 6 per cent. of a volatile oil, to which they owe their marked aromatic taste.

The oil yields, on being submitted to cold, nearly 40 per cent. of thymol, which may be purified by redistilling from calcium chloride. It occurs in large tabular crystals, having the odour of thyme. They sink in cold water, but when melted, float on the surface. Sp. gr. 1·026. When heated, the crystals volatilize entirely, melting between 110° F. and 123° F. Thymol forms with caustic soda a crystallisable and soluble compound.

No. 96. Anethi Fructus. *Dill Fruit.*

The dried fruit of Peucedanum graveolens (Anethum graveolens).

Habitat.—Found wild throughout Southern Europe, Asia Minor, and the Caucasus; cultivated in India.

Umbelliferæ.

Characters.—The cremocarp is broadly oval, surrounded by a membranous wing of a paler colour. When fully ripe it separates into two mericarps, which are flat upon their face and somewhat convex at the back; three of the ridges are sharply keeled, the other two extend into the flattened margin. The odour is agreeable and aromatic; the taste sweetish and aromatic. Indian Dill fruits are more elongated and narrower, of a lighter colour, and more convex at the back. They are produced by Anethum Sowa, which is considered by some botanists to be identical with A. graveolens.

Composition.—Dill fruits yield, on distillation with water, about 4 per cent. of an essential oil; no further examination of the fruit has been carried out.

The Essential Oil is of a pale yellow colour, becoming darker on keeping; it possesses the agreeable aromatic odour of the fruit; when sulphuric acid is added to it a red colour is produced.

Therapeutics.—Carminative.

Official Preparations.—Aqua Anethi, Oleum Anethi.

No. 97. Anisi Fructus. *Anise Fruit.*

The dried fruit of Pimpinella Anisum.

Habitat.—Indigenous to Asia Minor, Egypt, and Greece; cultivated in Southern and Central Europe, America, and India.

Characters.—The fruits are about one-fifth of an inch in length, the Russian variety being shorter. They are ovoid-oblong in form, of a grey-brown colour, and their entire surface is covered with short hairs. The two mericarps are always firmly united to the carpophore; each has five ridges, and on examining its transverse section fifteen vittæ are noticeable. The fruit has an agreeable aromatic odour, and sweet, spicy taste.

Alicante Anise is the best; next comes the German.

Composition.—The fruits yield about 2 per cent. of Volatile Oil; they also contain gum, sugar, and fixed oil.

Umbelliferæ.

The Volatile Oil is obtained by distilling the fruits with water; on cooling the oil separates from the aqueous distillate, and is easily removed.

Adulterations.—(*a*) *The fruit.* Occasionally conium fruits have been found, having become admixed by accident; they are readily distinguished by the mericarps being separate, and by their smooth surface.

(*b*) *The Volatile Oil.* The principal adulterants are wax, camphor, and alcohol; the two former raise the congealing point of the oil, and the first is insoluble in alcohol; if camphor were present it would dissolve with the oil, but on pouring the solution into warm water the camphor will separate in flocculi. Alcohol is best detected by treatment with fuchsine, which, if present, will colour the oil.

Therapeutics.—Carminative.

Official Preparations.—Aqua Anisi, Oleum Anisi.

No. 98. Carui Fructus. *Caraway Fruit.*

The dried fruits of Carum Carui (Carum Carvi).

Habitat.—Indigenous to Europe and Asia. It is largely cultivated in Holland, Russia, Germany, England, United States and Morocco.

Characters.—The fruits are generally separated into thin mericarps, which are from one-fourth to one-sixth of an inch long, somewhat curved, and tapering at the ends. Colour, brown; the surface is smooth, and the vittæ are conspicuous. Odour aromatic and agreeable; taste sweet, pleasant, and spicy.

In commerce the English caraways are considered the best, and command the highest price. They are shorter and more plump, and of a paler brown colour than the Dutch sort.

Composition.—The fruits contain a volatile oil and a green fatty oil, besides sugar, tannin, and gum. The Volatile Oil is generally prepared by passing a current of superheated steam through the crushed fruits, which, by this process, have yielded as much as 8 per cent.; the first portion contains principally carvene, the latter portion containing chiefly carvol. The oil is nearly colourless, or a pale yellow, becoming darker on keeping.

The unripe fruits contain a notable quantity of tannic acid.

Therapeutics.—Carminative.

Official Preparations.—Aq. Carui; Conf. Opii; Conf. Piperis; Ol. Carui; Pulv. Opii Co.; Tinct. Cardamomi Co.; Tinct. Sennæ.

No. 99. Coriandri Fructus. *Coriander Fruit.*

The dried ripe fruit of Coriandrum sativum.

Habitat.—The Mediterranean region, naturalized in many European countries; cultivated on a small scale in England.

Characters.—Coriander fruits are nearly globular, the mericarps being closely united, about one-fifth of an inch in diameter. Colour brownish-yellow; hard, faintly ribbed with primary and secondary ridges; two vittæ are found on the commissural surface. Taste agreeable, mild, and aromatic; when bruised the fruits exhale a pleasant odour. When unripe, they, like the fresh plant, have a strong disagreeable odour.

Composition.—The fruits yield about 1 per cent. of volatile oil, but they also contain 14 per cent. of fatty oil, and a little tannin.

The Volatile Oil contains an oxygenated hydrocarbon isomeric with borneol, and also a neutral offensive-smelling body.

Adulteration.—This oil is sometimes adulterated with essential oil of orange, which may be detected by heating a sample, or by the specific gravity.

Therapeutics.—Carminative.

Official Preparations.—Conf. Sennæ; Ol. Coriandri; Syr. Rhei; Tinct. Rhei; Tinct. Sennæ.

Umbelliferæ.

No. 100. Fœniculi Fructus. *Fennel Fruit.*

The dried fruits of cultivated plants of Fœniculum capillaceum (Fœniculum vulgare).

Habitat.—Indigenous to Southern Europe.

Characters.—From one-fifth to two-fifths of an inch in length, ovoid or oblong, slightly curved, surmounted by a prominent stylopodium, colour brown or greenish brown; smooth, with five prominent ridges on each mericarp; between the furrows are five vittæ, two occurring on the commissurial surface; odour aromatic; taste sweet, pleasant, and spicy. The fruits of the wild fennel are smaller and broader, darker in colour, and have a decided bitter taste.

Composition.—German and Roman Fennel yield on distillation about 4 per cent. of essential oil, besides which they contain 13 per cent. of fixed oil, and some sugar. The Volatile Oil is closely related to the oil of anise, consisting principally of anethol or anise camphor, and hydro-carbon isomeric with terpene.

Therapeutics.—Carminative.

Official Preparations.—Aq. Fœniculi; Pulv. Glycyrrhizæ Co.

No. 100a. Cuminum. *Cumin.*

(Not Official).

The ripe fruits of Cuminum Cyminum.

Habitat.—Indigenous to Egypt; cultivated in Europe.

Characters.—The fruits are usually attached to a short pedicel, and are about a quarter of an inch long, narrow at both ends, and a yellowish-brown colour. The ridges are usually covered with fine small hairs, and are separated by a broad furrow; odour strongly aromatic, and the taste closely resembles caraway.

Composition.—The fruits contain about 8 per cent. of a fatty oil, ·25 per cent. of a volatile oil, resin, and gum.

Umbelliferæ.

No. 101. Asafœtida. *Asafœtida.*

A gum-resin obtained by incision from the living root of Ferula Narthex (Narthex Asafœtida), and of Ferula Scorodosma, and probably other species.

Habitat.—The Narthex is found in Cashmir and Thibet, and the Scorodosma is found in Turkestan and Afghanistan, where it is largely cultivated.

Collection.—The natives first remove the soil from the roots during April; the leaves are then cut off, and the upper portion of the bared root is protected against the sun's heat by a layer of leaves and earth, and in this condition it is allowed to remain a little over a month; at the end of this time the covering is removed and a slice taken off the root and exuded juice removed; a day or two afterwards another slice is removed and time allowed for the juice to exude, and the operation is repeated from time to time until the root is exhausted.

Towards the end of the cutting the best quality of Asafœtida is obtained.

Characters.—Asafœtida rarely occurs in tears, generally in irregular masses, varying in consistency and size, made up of a number of agglutinated tears. When broken or cut it presents an amygdaloid appearance; the fractured tears are opaque and milk-white, rapidly changing on exposure to the air to a purplish pink or reddish pink, and finally to a yellowish brown colour. Taste bitter, acrid, and alliaceous; odour strong, alliaceous, and persistent. When treated with alcohol it should give up between 50 and 60 per cent. of its weight, and on incineration should not leave more than 10 per cent. of ash.

Commercially asafœtida is met with in two distinct qualities. The inferior, or second kind, which is largely admixed with earthy matter and stones, in called Hingra in Bombay.

Composition.—Asafœtida contains an essential oil, a resin, and gum.

Umbelliferæ.

The Essential Oil amounts to from 5 to 9 per cent. by weight of the drug.

The Resin varies from 45 to 65 per cent.

The Gum, which amounts to about 30 per cent., is closely related to Gum Acacia.

Adulteration.—The principal impurity consists of earthy matter, which sometimes amounts to 40 and even 50 per cent.; it is best detected by incinerating a sample.

Therapeutics.—A powerful antispasmodic.

Official Preparations.—Enema Asafœtidæ; Pil. Aloes et Asafœtidæ; Pil. Asafœtidæ Co.; Sp. Ammoniæ Fœtidus; Tinct. Asafœtidæ.

No. 102. **Galbanum.** *Galbanum.*

A gum-resin obtained from Ferula galbaniflua, Ferula rubricaulis, and probably other species.

Habitat.—The former is found mostly in Northern Persia and the latter in Southern Persia; other members of the genus are found in the Kirghiz Steppes.

Characters.—The finest quality of galbanum is found in tears varying considerably in size, or in masses of agglutinated tears; sometimes soft and semi-fluid. The tears are roundish or irregular in form, and vary in size from that of a lentil to a hazel nut, generally being about the size of a pea; in colour they are of various shades, orange brown, greenish yellow, or light brown, slightly translucent, usually rough or dirty on the surface, and when kept in the cold they become quite brittle, and easily powdered, when held in the hand they become plastic and sticky. The lump galbanum consists of masses of different degrees of softness, and on examination numerous impurities are found, such as thin slices of the stem or root, small stones and pieces of clay, &c. In colour it is generally of a dark brown. Both qualities possess a strong, disagreeable, slightly balsamic odour. The taste is bitter, alliaceous and unpleasant. When moistened with alcohol, and then with nitric acid, a purple colour is produced, and when a small portion is macerated in weak ammonia water a fine blue fluorescence is produced, due to umbelliferone.

Composition.—Galbanum contains an essential oil, resin, and gum. Crude samples usually contain about 16 per cent. of impurities.

The Essential Oil is best obtained by distilling the galbanum with water and separating the oil from the distillate, and allowing it to stand in contact with fused calcium chloride for a short time, the yield being 8 per cent.

The Resin constitutes from 50 to 60 per cent. of the drug, and after separation of the essential oil it can be extracted by treating the residue with ether, in which it dissolves quite readily.

The Gum is apparently a modification of arabinose, with which it closely agrees in its reactions. It constitutes about 20 per cent. of the galbanum.

Therapeutics.—Antispasmodic and expectorant.

Official Preparations.—Emp. Galbani ; Pil. Asafœtidæ Co.

No. 103. Ammoniacum. *Ammoniacum.*

A gum-resinous exudation from the stem (after being punctured by beetles) of Dorema Ammoniacum and probably of Dorema Aucheri.

Habitat.—Found principally in the barren districts of Persia and the Steppes of Tartary.

Collection.—The plant is infested to a remarkable extent by a peculiar beetle which punctures the stem, and in this way the milky juice exudes and rapidly dries into tears, which generally remain attached to the branches or stem. It is usually gathered during the months of June and July.

Characters.—Ammoniacum of best quality is always in tears, varying between $\frac{1}{16}$ and $\frac{1}{2}$ an inch in diameter. They are of an irregular rounded or sub-globular form, and externally of a pale cinnamon-brown colour, or white if recent, but internally milk-white ; when broken the fracture presents a waxy appearance ; the tears become quite brittle when kept in the cold for some time, and are easily reduced to powder. The odour is faint, increased on heating; the taste bitter, acrid, and nauseous. When triturated with water it forms a milky-white emulsion.

Lump Ammoniacum is often of inferior quality, consisting of densely agglutinated tears. It is usually prepared by making a transverse section of the crown of the root; and it contains a number of impurities, amongst which a large number of the ovoid fruits are easily recognized. When Ammoniacum is moistened with chlorinated lime or soda it acquires a bright orange colour.

Composition.—Ammoniacum consists of a mixture of resin, volatile oil, gum, and about 6 per cent. of moisture.

The Resin constitutes about 65 to 72 per cent. of the drug, and is composed of two resins, one being acid and the other neutral. When fused with caustic potash it yields no umbelliferone.

The Volatile Oil varies considerably, but the mean of four analyses gave 2·8 per cent.

The Gum usually amounts to about 24 per cent., and consists of 18 to 20 per cent. of arabin and about 4 per cent. of bassorin.

Allied Drugs.

African Ammoniacum is obtained from Ferula Tingitana, found growing principally in Morocco. It is rarely met with in English commerce, and can be readily distinguished by its more aromatic odour and the absence of a bitter taste. It contains about 70 per cent. of resin, 2 per cent. volatile oil, 10 per cent. gum, the residue being chiefly insoluble matter.

Opopanax is a gum-resin said to be derived from Opopanax Chironium (Pastinaca Opopanax), a plant indigenous to Southern Europe. It occurs in small tears of a reddish-brown colour and waxy fracture: odour strong and disagreeable; taste bitter, balsamic, slightly acrid. It contains a resin, volatile oil and gum.

Sagapenum is also a gum-resin derived from a species of Ferula growing in Persia. It has an alliaceous taste and odour.

Araliaceæ.

Therapeutics.—Expectorant and local irritant.

Official Preparations.—Emp. Ammoniaci cum Hydrargyro; Mist. Ammoniaci; Pil. Scillæ Co.; Phil. Ipecacuanhæ cum Scillâ.

No. 104. Sumbul Radix. *Sumbul Root.*

The dried transverse sections of the root of Ferula Sumbul (Euryangium Sumbul).

Habitat.—Found growing in Bokhara, Turkestan, and Central Asia.

Characters.—The entire root is about 12 to 16 inches in length, and spindle-shaped; but the transverse slices vary considerably in size, being usually one to three inches in diameter and about one inch to two inches long. The sections are of a light spongy texture, and the dusky brown papery cortex is annulated, frequently having small fibrous rootlets; internally the structure is marked with numerous resin ducts, and is farinaceous and fibrous; taste bitter and aromatic; odour strong and musk-like.

Composition.—Sumbul Root contains about 9 per cent. of resin, which is soluble in strong sulphuric acid, forming a crimson coloured solution, and also soluble in ether.

Adulteration.—The so-called Indian Sumbul is not the root of a species of Sumbul, but has been proved by Dymock to be derived from Dorema Ammoniacum, which is devoid of the musk-like odour. It is much harder, firmer, and denser.

Therapeutics.—Stimulant.

Official Preparation. Tinctura Sumbul.

ARALIACEÆ.

No. 105. Panax Radix. *Ginseng Root.*

(Not official.)

The washed and dried root of Panax quinquefolium (Aralia quinquefolium), and of Panax Schinseng.

Caprifoliacæ.

Habitat.—The former is found indigenous throughout North America, and the latter collected in Japan, Corea, and China.

Characters.—The American Ginseng Root is in fusiform pieces about three inches in length, marked by a number of transverse ridges, so as to appear closely annulated. It divides towards the point into two or three branches. Externally the root is of a light cinnamon brown colour; internally white, fracture short and mealy; taste aromatic and sweet; odour agreeable. The Chinese Ginseng Root is of somewhat darker colour and of a horny appearance, due to a partial baking to which the roots are submitted.

Composition.—Ginseng contains a resin, gum, starch, and a sweet principle, panaquilon.

Therapeutics.—The Chinese esteem ginseng root as a powerful aphrodisiac; but from trials of the same root in this country it has entirely failed to establish its reputation.

CAPRIFOLIACÆ.

No. 106. Sambuci Flores. *Elder Flowers.*

The fresh flowers of Sambucus nigra. From indigenous plants.

Habitat.—Indigenous throughout Europe.

Characters.—The elder produces large corymbose cymes, about five inches in diameter; they are five branched below and subdivided above. Flowers small, marginal ones radiate; calyx superior, minutely five-toothed, rotate in form, and pale yellow in colour; corolla flat, rotate, tube short, with five spreading lobes, whitish, having five stamens inserted in the tube. Odour, when fresh, disagreeable; on drying they acquire a sweet, pleasant smell. Taste bitter and mucilaginous. When elder flowers are well dried they are of a dull yellow colour.

Composition.—Elder flowers yield on distillation nearly ·5 per cent. of a yellowish, limpid volatile oil, possessing in a marked degree the odour of the drug.

Rubiaceæ.

Official Preparation.—Aqua Sambuci.

RUBIACEÆ.

Sub-order Cinchoneæ.

No. 107. Cinchonæ Cortex. *Cinchona Bark.*

The dried bark of any species of Cinchona, from which the peculiar alkaloids of the bark may be extracted.

Habitat.—The genus Cinchona, of which there are between thirty and forty species, are indigenous to South America, and are found principally on the western side of that continent.

Habitats of Cultivated Cinchonas.—During the last twenty years many species of cinchona have been cultivated in other countries, particularly in the Neilgherry Mountains, near Ootocamund, and on the Sikhim Himalayan range, in India; and in the mountainous regions of Ceylon, Java, and Jamaica, and more recently the cultivation has been attempted in Africa and Cape de Verde Islands. The cause of the enormous impetus given to the cultivation of cinchonas first originated from the destructive method of collection carried on in South America, and the continuous demand for large quantities of the bark.

Collection.—In South America, the cascarilleros, or bark collectors, having found a tree, first remove the under-shrub, thus making a clearing; then they remove the bark from the trunk and larger roots, which is first loosened by beating with a stick; the object being to remove the thick suberous layer; but on some varieties this layer naturally exfoliates. The removed bark is then spread out and piled up in layers, crossing one another at right angles; finally some heavy weight is placed on the top; this prevents the pieces from becoming quilled. After complete drying, the bark is examined, and all the bad pieces removed. The remainder is then packed in boxes or bales; sometimes it is enclosed in hides, constituting what is called a seron. After removal of the trunk bark, the tree is felled, and the bark removed from the branches; this is then spread out in sheds and dried, forming the quilled barks of commerce.

In India, Ceylon, and Java, and other places where the cinchonas are cultivated, several methods of collection are resorted to, the principal being coppicing, shaving, and mossing.

Coppicing consists in cutting the main axis at the root, and removing the bark. From the crown of the root spring numerous secondary axes, and these in a few years have their bark removed.

Shaving.—This process, which was first used by Moens in Java, consists in removing the outer layers of the bark by a spoke-shave, or other instrument suitable for the purpose. Great care is taken to leave sufficient covering to protect the cambium layer underneath, so as to preserve the vitality of the tree. After a lapse of three or four years the process can be repeated; only limited portions of the bark are treated at one time.

Mossing.—This process was first suggested by Karsten, and finally carried out by McIvor and others. Long strips of the bark are removed, and the surface afterwards wrapped over with a covering of moss to protect the cambium layer.

Uprooting.—When the plants are almost exhausted, they are pulled up, and the bark removed from the root. This bark is also rich in alkaloids.

Barks prepared by the process of mossing and shaving are in commerce known as renewed barks, and constitute about 95 per cent. of the present import of true cinchona bark.

Commerce.—In South America the barks are principally exported from the ports of Guayaquil, in Ecuador (red); Payta and Callo, in Peru (pale). Arica and Islay export the bark of Bolivia (yellow); Savanilla (Columbian or Carthagena). East Indian bark is exported from Colombo, Madras, Bombay, and Batavia. West Indian Bark comes from Jamaica.

Rubiaceæ.

No. 108. Cinchonæ Rubræ Cortex. *Red Cinchona Bark.*

The dried bark of the stem and branches of Cinchona succirubra.

The S. American bark is met with in flat pieces or quills, and the Indian renewed bark in quills, chips or shavings.

Characters.—Flat pieces; the bark of the trunk or old wood is generally in incurved pieces, varying from one-half to two inches in thickness, and four to twelve inches in length; it is coated with a suberous layer, which is very rough and marked with numerous warts or ridges, and occasionally with longitudinal fissures, and is sometimes of a soft and spongy texture; its inner surface is closely striate, fibrous, and of a dull red colour; fracture short and fibrous, the pieces are usually dense and heavy; taste astringent and bitter; no marked odour.

Quills.—This form of bark is generally about one quarter of an inch to an inch in width, and from six inches to two or three feet in length, and is either single or compound. The young form of this bark is covered externally by a thin silvery layer, which is marked by a netted arrangement of cork cells: in the older forms there are numerous warts of a paler hue, and it is rough from longitudinal ridges caused by the confluence of the corky warts. The suberous layer is of different shades of colour, from greyish-brown to rust-brown; older barks being of a reddish-brown colour; it is marked with occasional transverse cracks or annular fissures. The inner surface is of a cinnamon brown colour in young quills; in the thicker or older quills, of a brick red or reddish-brown colour; it is also irregularly and coarsely striated; fracture finely fibrous; powder brown or brownish-red; taste astringent and bitter.

Renewed Chips or Shavings.—This, which has lately become the most common form of red bark, occurs in small, occasionally in larger channelled pieces.; externally it is marked with numerous small light coloured warts, which in older pieces have become united to form a number of ridges; internally it is generally of a brownish-red colour; it varies considerably in its characters, depending on the length of time it has been allowed to grow; in thickness it rarely exceeds one-eighth of an inch, but more frequently it is of a papery texture. It is a valuable form of red bark.

Red Bark is the one now official for the preparations of the Pharmacopœia.

The bulk of red bark is imported from the East Indies.

Composition.—It should yield between 5 and 6 per cent. of total alkaloids, of which half should consist of quinine and cinchonidine.

Official Preparations.—Decoctum Cinchonæ; Extractum Cinchonæ Liquidum; Infusum Cinchonæ Acidum; Mistura Ferri Aromatica; Tinctura Cinchonæ; Tinctura Cinchonæ Composita.

No. 109. Cinchonæ Flavæ Cortex. *Yellow Cinchona Bark.*

The dried bark of the stem and branches of Cinchona Calisaya.

This bark occurs in commerce in coated quills, but very rarely in flat pieces; it was at one time considered the most valuable kind of Cinchona bark.

Flat Calisaya.—This form of the bark is met with in irregular pieces from twelve to eighteen inches in length, and three to five inches in breadth, and about a quarter to one-third of an inch in thickness. The suberous layer is rarely present, being removed before the bark is dried; sometimes pieces of the bark are marked with isolated patches of a dark brown colour, which are due to remains of the suberous layer; but it usually consists solely of the liber bark. Its colour is of a reddish orange-brown; it is irregular, presenting a grooved appearance (the so-called digital furrows); the inner surface is smooth and marked with very fine undulating or wavy striæ; texture uniform and fibrous; fracture finely fibrous, and the fibres of the fractured end are very short and easily removed.

Quill Calisaya is found in single or double quills, varying in size and length; the older quills are about one inch in diameter, covered with a greyish corky layer, which is fissured by deep transverse cracks, the edges of which are slightly elevated; the corky layer is in some cases thick and rugged, and can be easily removed with the finger nail; the exposed surface is of a light cinnamon brown colour, and the inner surface of a dark brown colour, and finely fibrous with minute wavy striæ. The transverse fracture is short and fibrous, and the powder of a light cinnamon brown colour. Quill Calisaya is generally in much thicker quills than either red or pale bark.

The Flat Calisaya, at present occurring in commerce, is not the true bark, but is derived from C. Peruviana, C. ovata, and other species. It is prepared in the same way, and bears some resemblance to the true Calisaya, but the bark is rougher on the inner surface, and does not present a wavy grain. This bark constitutes the bulk of the South American Flat Yellow of Commerce, and contains little or no quinine.

No. 110. Cinchonæ Pallidæ Cortex. *Pale Cinchona Bark.*

The dried bark of Cinchona officinalis, *var.* Condaminea, Bonplandiana and crispa, and occasionally of Cinchona micrantha.

This bark is known as Loxa, Crown, Huanuco, Lima or Grey Bark. It is now largely cultivated in India and the East Indies, and occurs in two forms, quills and chips. Indian pale bark is much richer in quinine than that from South America, which is often of a very mixed character.

Quilled Pale Bark.—The quills are from one-eighth to three-quarters of an inch in diameter, and vary much in size and appearance; the larger quills are sometimes double, and have a blackish-brown to greyish colour in the outer surface, which is also marked with numerous small transverse cracks, forming an irregular network, and is usually spotted with silver-grey lichens, which are sometimes very large and may be closely attached to the quill, or hang from it as a mass of fibrous material. The inner surface is finely striate, and is of a light yellowish or cinnamon brown colour; fracture fibrous, the fractured end showing fine short fibres on the inner surface, and somewhat long ones on the outer surface; taste astringent and bitter, with a characteristic odour.

Renewed Chips.—This form of bark, which is principally imported from Ceylon and India, always occurs in small shavings, and may usually be distinguished from the shavings of red bark by their paler appearance on the outer surface; but it must of necessity follow that barks which are submitted to this treatment should bear a close resemblance to one another, and this makes it a point of extreme difficulty to recognize them.

Pale Bark, obtained from Cinchona micrantha, is generally of a lighter grey colour, softer and more corky externally, and the transverse fissures not so well marked, and the bast fibres of the inner surface are nearly always in scattered groups, and there is a total absence of laticiferous ducts, so characteristic of young quills of C. officinalis.

Cinchonæ Carthagenæ Cortex. *Carthagena Bark.*

The dried bark with the suberous layer more or less removed of Cinchona cordifolia, Cinchona lancifolia, and C. lanceolata and other species.

This bark is almost entirely shipped from South America, and is known in commerce as Columbian, Coqueta, New Granada, or Carthagena Bark, and it is further distinguished as hard or soft Columbian Bark.

No. 112. Cinchonæ Cordifoliæ Cortex. *Hard Columbian Bark.*

This bark is generally in incurved pieces, from one-eighth to a quarter of an inch thick, one to two inches broad, and about six inches in length; externally it is somewhat rough, and marked with glossy patches of the mesophlœum; the inner surface is striate, but rarely presents a wavy outline; the colour is brownish yellow; it is hard, and breaks internally with a long, and externally with a short fracture; the broken ends being marked with long fibres which are easily removed.

Rubiaceæ.

No. 113. Cinchonæ Lancifoliæ Cortex. *Soft Columbian Bark.*

The barks are either in flat pieces or thick quills. From the natural tendency of these and other species of Cinchona to exfoliate the outer suberous layer they present a smooth appearance externally, which is marked sometimes all over with the shining, white, thin layer of the mesophlœum. The inner surface is finely, striate, and of a brownish-yellow or orange-brown colour ; fracture long and fibrous ; taste bitter and astringent. These barks are sometimes called fibrous Calisaya bark, and are principally used for the preparation of the alkaloids.

Composition of Cinchona Barks.

Cinchona barks contain, as their most important constituents, several alkaloids, the chief of which are quinine, quinidine, cinchonine, cinchonidine, and quinamine, and a number of minor importance, which differ principally in their physical appearance and chemical reactions. Together with the alkaloids there occur cinchotannic, kinic, and quinovic acids, quinovin and cinchona-red. The alkaloids principally occur as cinchotannates and kinates.

Quinine.—This, the most important alkaloid in cinchona bark, forms colourless needle-shaped crystals, but is generally met with as a crystalline powder ; it is inodorous, and possesses a marked persistent bitter taste. It is a strong base, neutralizing acids, and forming crystalline salts ; it is soluble in two thousand parts of cold water, but dissolves more freely in boiling water, or glycerine. Its solution in dilute sulphuric acid exhibits a blue fluorescence, which is destroyed when hydrochloric acid is added. When freshly precipitated it dissolves in a considerable excess of solution of ammonia. On the addition of chlorine water, or better, bromine water, and then solution of ammonia, to solutions containing quinine, a dark emerald green colour is produced, or in very strong solutions a green precipitate ; this is due to the formation of thalleioquin or dalleiochine ; if the quinine solution is added to chlorine or bromine water, then a few drops of potassium ferrocyanide solution added, and finally the ammonia solution, a fine crimson-red colour is produced.

Estimation of Cinchona Bark.

British Pharmacopœia Method.—This process is divided into two parts; first, estimation of quinine and cinchonidine, and, second, estimation of total alkaloids. Process:—200 grains of bark in No. 60 powder are mixed with 60 grains of slaked lime, and then moistened with half an ounce of water, and the mixture allowed to stand two hours. The moist powder is then transferred to a flask and boiled repeatedly with benzolated amylic alcohol, the liquid being drawn off after each boiling. The residue is then exhausted by percolation with the benzolated amylic alcohol. The united liquids are now placed in a stoppered separator, and to this is added twenty minims of diluted hydrochloric acid previously mixed with two fluid drachms of water; shaken well and then allowed to separate, the acid liquid is then drawn off, rendered exactly neutral with ammonia, and evaporated to three fluid drachms. Then about fifteen grains of tartrated soda, dissolved in twice its weight of water, are added, and the mixture well stirred, set aside for one hour, and filtered, the filter washed, and the washings added to the filtrate, then dried and weighed. The resulting insoluble tartrates of quinine and cinchonidine contain eight-tenths of their weight of the alkaloids, which, divided by two, gives the percentage. If now to the mother liquor, ammonia be added in excess, and the resulting precipitate collected, washed, dried, and weighed, and this weight divided by two, the result added to the preceding weight will give the percentage of total alkaloids. This process is an unsatisfactory one, as the bulk of fluid required to exhaust 200 grains of bark is difficult to manipulate, and the time required to complete an assay is a little under twelve hours.

Reactions which take place during the estimation.

1. The lime is used to set free the alkaloids, by combining with the acids.

Rubiaceæ.

2. The benzolated amylic alcohol dissolves the alkaloids out and thus exhausts the bark.

3. The hydrochloric acid combines with the alkaloids to form hydrochlorates.

4. The solution of ammonia is added to neutralize the acid.

5. The tartrated soda precipitates the quinine and cinchonidine as insoluble tartrates.

6. Excess of ammonia is added to precipitate the remaining alkaloids.

No. 114. Cortex Remijiæ. *Cuprea Bark.*

The dried bark from the stem and branches of Remijia pedunculata and Remijia Purdieana.

Habitat.—The cuprea, or copper coloured bark, as found in commerce, is obtained from two distinct districts, viz., Southern Bogota, near the Orinoko, and the lower part of the Magdalena river, in the mountainous ranges adjoining Bucaramanga, in Columbia.

Characters.—Cuprea Bark usually occurs in quills or channelled pieces, or in fragments, varying considerably in length, diameter, and thickness. Externally they are sometimes covered with a brownish-grey suberous layer, which is marked with longitudinal ridges, presenting a netted appearance, or in older pieces this layer becomes slightly fissured transversely, and very rough or warty; internally it is of a copper-red colour, and marked with longitudinal striæ. It is very hard, heavy and compact, fracture coarsely granular, taste bitter and astringent.

Composition.—The principal constituents are homoquinine, cinchonine, cinchonamine.

SUB-ORDER COFFEÆ.

No. 115. Ipecacuanhæ Radix. *Ipecacuanha Root.*

The dried root of Cephaëlis Ipecacuanha.

Habitat.—This plant, of which there are two varieties, one with an herbaceous and the other with a woody stem, is found growing in the damp forests of Brazil and New

Rubiaceæ.

Granada. The cultivation has been attempted in the Sikkim Himalaya, in India, but with little success.

Characters.—Ipecacuanha root occurs in somewhat twisted or curved pieces, from 2 to 4 inches in length, and about $\frac{1}{6}$ of an inch in diameter; the very small and thin roots should be rejected. It is composed of two parts, namely:—a central inert whitish axis, which is tough and minutely porous, and a thick cortical or active portion, which is brittle, finely wrinkled, and closely annulated by projecting circles. It is brown, greyish-brown, or reddish-brown in colour, and has a resinous waxy fracture; taste slightly acrid and bitter; odour musty and nauseous. The bark amounts to about 80 per cent. by weight of the root.

Composition.—Ipecacuanha contains Emetine, ipecacuanhic acid, erythrocephalein, a trace of volatile oil, sugar, gum, and pectin.

Adulterations.—Imported ipecacuanha is frequently mixed with the stem of the same plant, which is readily distinguished by the smooth surface and absence of rings, and well developed woody centre, which does not present the finely porous structure of that part of the root. As there are several emetic roots found in South America, the following may occasionally be met with in commerce.

1. *Striated Ipecacuanha*, the root of Psychotria emetica. The bark is of a deep brown colour, and marked by a few deep irregular transverse fissures, and numerous longitudinal striæ, and is nearly one-third of an inch thick; taste at first sweet, then bitter.

2. *Undulated Ipecacuanha*, the root of Richardsonia scabra. The bark contains a large quantity of starch, and is of a whitish appearance internally, brown externally; fissured on alternate sides and irregularly undulate.

3. *Rio Ipecacuanha*, the root of Ionidium Ipecacuanha (Violaceæ). This twisted and tortuous root is about six inches in length; of a yellow or light grey colour, and peculiar musty odour. It may readily be distinguished from true ipecacuanha by its larger size, more woody texture, and by being branched.

Rubiaceæ.

Therapeutics.—Expectorant, diaphoretic, and emetic.

Official Preparations.—Pil. Conii; Pil. Ipecacuanhæ cum Scillâ; Pulv. Ipecacuanhæ Co.; Trochisci Ipecacuanhæ; Trochisci Morphinæ et Ipecacuanhæ; Vin. Ipecacuanhæ.

No. 116. Coffea. *Coffee.*

The seeds of the fruit of Coffea arabica, Coffea liberica, and other species.

Habitat.—The coffee plant is indigenous to Central Africa and the Mozambique coast; and it has been introduced and cultivated to a large extent in Ceylon, Java, and other East Indian islands, South America, and the West Indies.

Characters.—The coffee plants sometimes reach a height of thirty feet, and bear numerous oval drupaceous fruits of a dark purple hue, bearing two plano-convex seeds, arranged with their flat sides towards one another. The fruit of Coffea liberica is nearly twice as large as that of Coffea arabica. The seeds are usually divested of their enclosing endocarp; the testa is finely wrinkled, and on the flat sides there is a deep groove. The embryo is situated at one end on the convex side; in form the seeds are oval; they vary in the shade of colour, and possess a faint peculiar odour, and a slightly sweet astringent taste. On drying the seeds the flavour is considerably improved.

Preparation.—Coffee seeds, prior to use, are submitted to a process of roasting at a temperature of about 450° F. for some time, when they assume a dark reddish brown colour, and become very brittle and easily reduced to powder, and at the same time they acquire a more agreeable taste, and yield a greater proportion of soluble matter to water. During the roasting, certain changes of the constituents take place, more particularly of the tannin and fat, producing amongst other products a pyrogenated volatile oil, to which the characteristic aroma is due.

Composition.—Coffee contains caffeine, caffeo-tannic acid, coffee fat, and glucose.

Official Preparation.—Caffeina.

Rubiaceæ.

SUB-ORDER NAUCLEÆ.

No. 117. Catechu. *Catechu.*

Synonyms :—Gambier, Catechu Pallidum.

An extract of the leaves and young shoots of Uncaria Gambier. It is also prepared from Uncaria acida.

Habitat.—It is a native of the countries bordering the Straits of Malacca, Ceylon, Sumatra, and cultivated to a large extent near Singapore.

Preparation.—The leaves and young shoots are removed from the plant, placed in earthen vessels containing water, and boiled for some time, or until a strong decoction is made ; this is then removed, and the residue expressed, generally with the hands. The decoction is evaporated to the consistency of a syrupy liquid, and then poured into buckets and stirred, when it gradually sets into a stiff mass, which is poured into shallow boxes, and allowed to stand until sufficiently firm, when it is cut into cubes, and finally dried in the shade.

Gambier is chiefly exported from Singapore.

Characters.—Gambier occurs in cubes or masses of variable size and form ; sometimes in masses of agglutinated cubes. The cubes are about an inch square on each side, of a dark reddish-brown colour externally, light cinnamon brown or buff internally; they are dry, porous, friable, and break with a dull, earthy fracture. Taste astringent, and at first bitter, subsequently sweetish. When examined under the microscope, catechu is seen to consist principally of minute crystals. It is partially soluble in cold water, almost entirely in boiling water; but the solution on cooling deposits a precipitate. When treated with hot alcohol it yields a clear brown liquid, and the undissolved residue should not amount to more than 15 or 16 per cent. by weight.

Composition.—In composition gambier is related to Cutch (Black Catechu) ; namely—catechu-tannic acid, catechin or catechuic acid, quercetin, and possibly quinovic acid.

Valerianaceæ.

Therapeutics.—Astringent.

Official Preparations.—Inf. Catechu; Pulv. Catechu Co. Tinct. Catechu; and Trochisci Catechu.

VALERIANACEÆ.

No. 118. Valerianæ Rhizoma. *Valerian Rhizome.*

The dried rhizome and rootlets of Valeriana officinalis. Collected in autumn from plants growing wild or cultivated in Britain.

Habitat.—Indigenous to Europe, cultivated in Holland, and in this country principally in Derbyshire. The wild plant presents a number of aberrant forms.

Characters.—Valerian rhizome is a short, upright rhizome with a truncate end, entire or sliced, dark yellowish-brown externally, giving off numerous brittle, light greyish-brown shrivelled rootlets, two or three inches long. Internally the rhizome and rootlets present a white appearance. When fresh the rhizome is fleshy, with a very slight odour, which becomes strong and disagreeable on drying. Taste camphoraceous, slightly bitter and unpleasant.

Composition.—Valerian contains tannin, resin, sugar, and a volatile oil which is its principal constituent.

The Volatile Oil is obtained by distilling the drug with water, the quantity obtained varies from $\frac{1}{2}$ to 2 per cent.

Adulterations.—Occasionally this drug has been sophisticated with mixtures of poisonous rhizomes, amongst which have been found the rhizomes of Sium longifolium, Asclepias Vincetoxicum, and Veratrum album. The rhizome of Sium longifolium is lighter in colour, and its rootlets are very wrinkled; that of Asclepias Vincetoxicum is very knotty, and furnished with tufts of pale roots at intervals, whilst that of Veratrum album is larger, with crowded leaf bases on the upper portion.

Therapeutics.—Nervine stimulant.

Official Preparations.—Inf. Valerianæ; Tinct. Valerianæ; and Tinct. Valerianæ Co.

COMPOSITÆ.

No. 119. Pyrethri Radix. *Pellitory Root.*

The dried root of Anacyclus Pyrethrum.

Habitat.—The plant is a native of the north-west of Africa, and is principally exported from Algeria and Tunis to Marseilles and other French ports.

Characters.—The root as found in commerce is in unbranched, cylindrical pieces, from 2 to 4 inches in length, somewhat tapering towards the apex. It is covered with a thick, shrivelled, brown coloured bark, marked with irregular circles of resin cells. It breaks with a short fracture, and the fractured surface presents a fine radiate structure. It is inodorous; but when chewed it has an aromatic, acrid taste, producing at the same time a pricking sensation of the throat with glowing heat.

Composition.—A peculiar alkaloid, pyrethrine, a resin, and small traces of a volatile oil.

Substitutes.—The root of Anacyclus officinarum yields the German pellitory root. It is closely related to the official drug in all its characters, except thickness, being only about half the size, and furnished with numerous rootlets, and, if anything, a shade lighter in colour.

Therapeutics.—Sialogogue.

Official Preparation.—Tinct. Pyrethri.

No. 119a. Pyrethrum Cinerariæfolium.

The poisonous principle of this has not been analysed, and is known as Dalmatian Insect powder or "insecticide."

No. 120. Santonica. *Santonica.*

The dried unexpanded flower-heads or capitula of Artemisia maritima, var. Stechmanniana.

Habitat.—The plant is largely cultivated on the Steppes of Turkestan, from which it seems to be mainly obtained; it is sent to Nishnei Novgorod, and from thence distributed to other countries.

Compositæ.

Characters.—Santonica or Levant wormseed consists of the unexpanded minute capitula, about one-tenth of an inch in length, oblong ovoid, obtuse, pale greyish-green, changing to brownish-green on exposure to light. The involucre is composed of twelve or more scales, densely imbricated, enclosing three or five small undeveloped tubular florets. Odour strong and peculiar, slightly camphoraceous, taste bitter and unpleasant. There are several varieties of wormseed, but only the Levant or Russian is official.

1. Levant or Russian Wormseed, from A. maritima var. Stechmanniana.
2. Barbary Wormseed, from A. ramosa.
3. Indian Wormseed, from A. species.
4. American Wormseed, from Chenopodium ambrosioides.

The last is not met with in European commerce, but has been found as an adulteration in American. It consists of the fruit, and bears no resemblance whatever to Santonica. The Barbary and Indian varieties contain little or no santonin, and they usually present a hairy appearance.

Composition.—Wormseed contains about 2 per cent. of a peculiar body santonin, resin, and about 2 per cent. of a volatile oil, to which the odour of the drug is due.

Adulteration of Santonine.—Santonine is sometimes met with containing boracic acid; this is readily detected by the glassy residue left on incineration, and by the green colour it imparts to the flame. Strychnine has, on more than one occasion, been mistaken for santonine; it may be distinguished by its intense bitterness, insolubility in alkalies, and by the violet coloration with sulphuric acid and potassium bichromate.

Tests.—Santonine dissolved in strong sulphuric acid, and then diluted with water, on filtering should not give any precipitate on the addition of Mayer's reagent, proving absence of alkaloids.

Therapeutics.—Anthelmintic.

Official Preparation.—Santoninum.

Compositæ.

No. 121. Anthemidis Flores. *Chamomile flowers.*

The dried single and double flower-heads or capitula of Anthemis nobilis, collected from cultivated plants.

Habitat.—Indigenous to Central and Southern Europe, including England and Ireland. Cultivated chiefly in Germany, Belgium, France, and Britain.

Characters.—The single chamomile flowers are those in which the capitula have a single row of white ligulate florets of the ray, surrounding a large number of the yellow tubular florets of the disc, they are not frequently met with in commerce; the double flowers are those in which all or nearly all the yellow tubular florets of the disc have, by cultivation, become changed into the white ligulate florets. What are known in English commerce as single chamomiles are really double, but have a few single florets in the centre. The truly single ones are known as Scotch chamomiles. Chamomile flowers of both varieties have a solid, conical receptacle, densely covered with numerous imbricated scales having a scarious margin; the white ligulate florets are tridentate and pistillate, while the yellow tubular florets are quinquedentate, hermaphrodite, being exserted with a forked stigma, the style branched. The flowers possess a peculiar strong aromatic odour and persistent bitter taste, more prominent in the single flowers.

Composition.—Chamomile flowers contain an essential oil, a bitter principle (anthemic acid), resin, tannin, and chlorophyll.

The Essential Oil, which is prepared by distillation, is obtained to the extent of ·5 per cent., and when prepared from the fresh flowers is of a blue colour, which changes on keeping to green and then yellow; the dried flowers yield a greenish-yellow oil.

Adulteration.—The capitula of several Compositæ have been found as an occasional adulteration, amongst them being those of Pyrethrum Parthenium or Feverfew, and Matricaria Chamomilla; the former are distinguished by

Compositæ.

their flat and nearly naked receptacles, and the latter by the hollow conical receptacles devoid of scales.

Therapeutics.—Aromatic tonic.

Official Preparations.—Ext. Anthemidis, Inf. Anthemidis, and Ol. Anthemidis.

No. 122. **Taraxaci Radix.** *Dandelion Root.*

The fresh and dried roots of Taraxacum officinale (Taraxacum Dens-leonis), gathered in the autumn.

Habitat.—Indigenous throughout Europe, North America, and Central and Northern Asia.

Characters.—The root, when fresh, is from 6 to 18 inches in length and about half an inch in diameter, nearly cylindrical, simple or slightly branched, and crowned with a few small heads. Externally it is smooth and of a yellowish-brown colour; white within. The root is brittle and fleshy, and when broken a milky juice exudes. The dried root is wrinkled longitudinally, dark coffee-brown colour externally, and much shrivelled; fracture short, showing a yellow porous central woody axis, surrounded by a thick whitish bark having a number of concentric rings; taste bitter. When exposed to a damp atmosphere it absorbs moisture and becomes slightly flexible. The juice increases in density and bitterness during the autumn, and yields a better extract than that collected at any other season. The root is frequently attacked by maggots, and should not be kept more than one season.

Composition.—A bitter principle, taraxacin, and an acrid resin. The composition of this root varies considerably, according to the season in which it is collected; during the spring it contains notable quantities of an uncrystallizable sugar and lævulose, with only minute quantities of inulin; during the autumn it contains only traces of sugar.

Substitution.—The root of Leontodon hispidus (Hawkbit), is sometimes supplied in place of dandelion; it contains very little if any juice and is extremely tough.

Compositæ.

Therapeutics.—An alterative in liver complaints.

Official Preparations.—Dec. Taraxaci; Ext. Taraxaci; Ext. Taraxaci Liq.; and Succus Taraxaci.

No. 123. Arnicæ Rhizoma. *Arnica Rhizome.*

Synonym:—Arnicæ Radix.

The dried rhizome and rootlets of Arnica montana.

Habitat.—Indigenous to the mountainous parts of Central Europe and Northern Asia; it is also found in the northern districts of America.

Characters.—The rhizome is thin, contorted, cylindrical, from 1 to 3 inches in length and about a quarter of an inch in diameter, and rough from the scars of fallen leaves; a few leaves are sometimes attached at its upper end, and have a coriaceous texture; on the under surface of the rhizome numerous dark brown, fine, thread-like rootlets are given off. In colour the rhizome is dark brown externally, white internally, with a circle of yellow resin cells. This same character is evident on examining a transverse section of the rootlets. Odour slightly aromatic and peculiar; taste persistently acrid and bitter. The rhizome is collected during the spring. Before being used, adherent leaves should be removed.

Composition.—A peculiar essential oil, and a principle, arnicin, and inulin, with small quantities of gum and wax.

The Essential Oil obtained from the dried rhizome by Sigel amounted to ·5 per cent.

Adulteration.—The roots of various Composites are occasionally substituted, and latterly the astringent root of Geum urbanum has been found in it, but there is little difficulty in detecting the fraud, as the latter is a root, and has a purplish meditullium.

Therapeutics.—Used externally for bruises, internally in paralysis.

Official Preparation.—Tinctura Arnicæ.

Compositæ.

No. 123a. Arnicæ Flores. *Arnica Flowers.*

(Not official.)

The flowers are frequently used in place of the rhizome, particularly on the Continent. The capitula are large and handsome, of a bright yellow colour. The involucre consists of two rows of hairy scales, which are imbricated ; the receptacle is covered with a number of chaffy scales ; the ligulate ray florets are about one inch in length ; tubular perfect florets numerous. Prior to use, the florets should be removed from the receptacle.

Adulteration.—Other yellow Composite flowers are sometimes met with, including those of Inula britannica, Senecio, and Calendula ; the last are most easily recognized by the absence of pappus and the naked receptacle.

No. 124. Lactuca. *Lettuce.*

The flowering herb of Lactuca virosa.

Habitat.—Indigenous to Western and Southern Europe, and this country.

Characters.—Prickly Lettuce is a biennial herb, growing to a height of from 3 to 6 feet ; the stem is cylindrical, pale green with a few purplish spots, and prickly near its base. The stem leaves are smaller than the radical leaves, and are slightly amplexicaul at the base, with an acute apex, and are sessile ; both leaves are of a pale green colour, ovate oblong, and midrib prickly and white. The slender capitula are generally situated on short axillary peduncles, and are of a pale yellow colour. The entire plant has a peculiar disagreeable narcotic odour and bitter taste, and abounds in a milky juice.

Composition.—No modern analysis of the plant has been made, chemists devoting their investigation solely to lactucarium.

Therapeutics —Hypnotic and sedative.

Official Preparation.—Extractum Lactucæ.

Compositæ.

No. 125. Lactucarium. *Lactucarium.*

(Not official.)

Synonym :—Lettuce Opium.

The inspissated latex or milk-juice obtained from Lactuca virosa, L. Scariola, L. altissima, and L. sativa.

Habitat.—Lactucarium is principally collected in Germany and Great Britain.

Secretion and Collection.—The stem has two systems of laticiferous vessels, separated by an intervening zone of wood; the outer system is formed in the bark and the inner system in the pith. The collection commences in July, the collector cutting off the apex of the stem, and the milky juice, which instantly exudes, is scraped off into earthen vessels, the process being repeated several times during the day on the same plant. In Germany the juice is collected by the finger. After collection it quickly hardens, and is then transferred from the vessels and cut into square masses, and finally dried by exposure to sunshine or artificial heat, acquiring a light brown colour externally.

Characters.—Lactucarium is met with in irregular angular, earthy-like masses, or in small circular cakes, externally greyish-brown or reddish-brown, internally of a lighter colour, opaque, and sometimes presents a waxy appearance. It has a marked disagreeable, opiate odour, and bitter taste. The powder is not readily miscible with water.

Therapeutics.—Hypnotic and sedative.

No. 125a. Tussilago Farfara. *Coltsfoot.*

The leaves and flower-heads of Tussilago Farfara.

Habitat.—Indigenous.

The plant is employed as a popular remedy in chronic coughs, and other pulmonary complaints.

Compositæ.

No. 126. Inulæ Radix. *Elecampane.*

(Not official.)

The dried root of Inula Helenium, entire or split longitudinally.

Habitat.—Indigenous to Central and Southern Europe, and found in some districts in England. It is cultivated in England and Holland.

Characters.—The root is about 6 inches long and branched below; thick, fleshy, the branches being about 1½-inch in diameter; externally marked irregularly, and of a greyish-brown colour; internally white and juicy when fresh, grey after drying, with a strong aromatic camphoraceous odour and bitter taste. In commerce the thicker roots are sliced longitudinally, and frequently strung on a thin cord, and become flexible if kept in a damp place.

Composition.—Elecampane contains Alant camphor, an essential oil, inulin, resin, and a bitter principle.

No. 126a. Grindelia robusta et squarrosa.

(Not official.)

The leaves and flowering tops.

Habitat.—California.

The drug imported into this country is G. Squarrosa, but it is quite equal to the robusta in the amount of resin it contains.

No. 126b. Calendulæ Flores. *Marigold Flowers.*

The dried fully-expanded florets of Calendula officinalis.

Habitat.—Cultivated in European countries.

Characters.—The capitula are about two inches broad, with a flat receptacle and possess *paleæ.* The ray florets are in two rows, ligulate and pistillate, the disk florets tubular fine cleft, neuter or staminate. Both ray and disk florets are of a bright orange-yellow colour, and possess a heavy, disagreeable odour.

Composition.—The flower heads yield a peculiar bitter principle, and a yellow colouring substance called calendulin.

LOBELIACEÆ.

No. 127. Lobelia. *Lobelia. Indian Tobacco.*

The dried flowering herb of Lobelia inflata.

Habitat.—Indigenous to the North American Continent.

Characters.—The herb grows to a height of about 2 feet, the primary axis throwing off a number of slender branches. The leaves are 1 to 3 inches long, alternate, ovate oblong, faintly toothed, pale green, pubescent, and are situated principally on the middle, and lower portions of the axis. The upper ones are sessile, whilst the lower have short petioles. The small flowers are in long racemes at the apex of the stem and branches, calyx persistent, corolla bilabiate, and pale blue. The fruit is a small round capsule, bilocular, each loculus containing a number of small seeds, having a finely reticulated and pitted testa. Odour herbaceous and irritating; taste at first mild, afterwards burning and acrid, like tobacco. As met with in commerce it is in flat or circular compressed cakes, of a yellowish-green colour, weighing from half a pound to a pound each, wrapped in coloured paper and sealed.

Composition.—Lobelia contains a liquid alkaloid lobeline, an essential oil, and an acrid resin lobelacrin.

Therapeutics.—Antispasmodic and expectorant.

Official Preparations.—Tinct. Lobeliæ, and Tinct. Lobeliæ Ætherea.

ERICACEÆ.

No. 128. Uvæ Ursi Folia. *Bearberry Leaves.*

The dried leaves of Arctostaphylos Uvæ-ursi (Arbutus Uvæ-ursi).

Habitat.—The bearberry is a trailing evergreen shrub, found in northern latitudes. It is found in Northern Europe, North America, and Northern Asia. In Great Britain it is found throughout Scotland, but only in the north of Ireland, and in the northern counties of England.

Characters.—Bearberry leaves are almost sessile, spatulate, or obovate, coriaceous, about half an inch long; apex obtuse, margin entire and somewhat revolute; upper surface smooth and shiny, under surface pale green, and finely reticulated. Odour hay-like, more pronounced on powdering; taste faintly bitter, and strongly astringent. The plant bears short pendulous racemes of white urceolate flowers, and bright red drupaceous fruits, which ripen in September, at which time the leaves should be collected.

Composition.—Bearberry leaves contain about 35 per cent. of tannic acid, traces of gallic acid, and a characteristic principle arbutin.

Adulteration.—The leaves of the following plants are occasionally confounded with those of bearberry:—

(*a.*) *Buxus sempervirens.* Box leaves are broader and larger, pale green colour, narrower towards the apex, ovate in form, only faintly astringent, and intensely bitter.

(*b.*) *Vaccinium Vitis-Idæa.* Cowberry or Red Whortleberry. They have a finely crenate margin, the apex reticulated, and are dotted on the under surface; the margin is more revolute.

(*c.*) *Vaccinium uliginosum.* Bog Bilberry. They [are pubescent on the under surface, pale green in colour, and are not coriaceous.

Therapeutics.—Astringent.

Official Preparation.—Infusum Uvæ Ursi.

SAPOTACEÆ.

No. 129. Gutta-Percha. *Gutta-Percha.*

Synonym:—Gutta Taban.

The concrete milky juice obtained from incisions in the trunk of Dichopsis Gutta (Isonandra Gutta), and of several other trees of this natural order including other species of Dichopsis, Ceratophorus and Payena.

Habitat.—The Taban tree and other members of the genus are all indigenous to Southern India, Ceylon, Sumatra, Borneo, and the Malayan Archipelago.

Collection.—The taban or gutta-percha tree grows to a height of sixty to seventy feet, bearing numerous thick glossy entire leaves which have a coriaceous texture. The inner bark and young wood contain a considerable quantity of latex. The older method of collection, practised in Singapore, was to fell the tree and then make a series of incisions, when the latex exuded, and rapidly hardened, after which it was removed. This method had most disastrous results, in a short time the tree became extinct in Singapore. It is now collected in Borneo and other islands by tapping the trees and collecting the hardened latex. By this means as much as 20 lbs. have been obtained from one tree.

Characters.—Raw gutta-percha arrives in this country in large roundish masses, weighing about six pounds. In this condition it is first softened with boiling water; and then torn into fine shreds by revolving cylinders covered with sharp teeth, and thrown into tanks of cold water, the shreds are collected, treated with warm water, and then kneaded by machinery into masses. Prepared gutta-percha occurs in pieces of a greyish, yellowish, or reddish-brown colour; leathery or horny, tough, flexible, and plastic above 120° F., and very soft at 212° F. It is insoluble in water, alkaline solutions, dilute acids, or alcohol; soluble in chloroform, terebinthine, benzol, carbon disulphide, and coal tar oils. It is obtained as a white mass by treatment with dilute hydrochloric acid, and then repeated solutions in ether or chloroform.

Composition.—Gutta-percha consists almost entirely of a hydrocarbon.

Official Preparation.—Liquor Gutta-Percha.

STYRACEÆ.

No. 130. Benzoinum. *Benzoin.*

A balsamic resin obtained from Styrax Benzoin, and probably from one or more species of Styrax.

Habitat.—The benzoin trees are indigenous to Siam, Sumatra, Borneo, Cochin China, and Java.

Collection.—When the tree is about six years old and has attained a diameter of three feet, it can be bled. The natives wait until the leaves wither and fall off, they then make a number of deep incisions into the bark, when a milky, resinous liquid exudes, which soon hardens and falls to the ground, or is removed. In commerce there are four varieties of Benzoin, viz.:—Sumatra, Siam, Penang, and Palembang. They can be readily recognized from one another by the following characteristics.

Characters.—1. Sumatra Benzoin is met with in commerce in cubic blocks weighing from 1 to 2 cwt., which, when broken, present a granitoid appearance, generally of a grey colour. The mass is made up of numerous tears of a milk white colour, sometimes very small, and imbedded in a brown coloured resin. The broken surface rarely presents a distinct amygdaloid appearance; in inferior benzoin the tears are entirely absent and the mass of a darker colour, and sometimes consisting principally of small pieces of bark. Odour fragrant and agreeable, but not nearly so marked as the Siam benzoin. 2. Penang Benzoin is identical in appearance with the Sumatra drug, principally differing in odour, which is decidedly different from that of Siam or Sumatra benzoin, and resembles that of liquid Storax. 3. Palembang Benzoin closely resembles the Sumatra kind in odour, but differs principally in its greater transparency. Its alcoholic solution gives a flaky precipitate with water (Saalfeld). It is said to yield a greater percentage of benzoic acid. 4. Siam Benzoin. This is the most esteemed kind of benzoin. It frequently occurs in large, flattish tears, or in loose masses of tears agglutinated together with a clear brown resin, or it may consist entirely of the resin. The mass presents a reddish-brown granitoid appearance. Odour is agreeably balsamic, and slightly resembles vanilla; the tears when fractured present a stratified appearance, the milky white surface becoming brown on exposure to the air.

Benzoin is brittle and readily softens when held in the mouth; it gives off, when heated, the fumes of benzoic acid; it should be almost entirely soluble in six times its weight of alcohol. It is principally shipped from the ports of Penang, Bangkok, and Singapore. According to the quality it is known under the different terms Head, Belly, and Foot, oriental terms synonymous with superior, medium, and inferior.

Composition.—Benzoin contains several resins, benzoic acid, and essential oil. Vanillin and cinnamic acid have also been found in some samples.

The Resins are only partially soluble in ether, but entirely soluble in caustic potash solution, or strong alcohol.

Benzoic Acid.—This acid is prepared either by the wet method or by sublimation: the former method yields a purer and almost odourless acid. Wet method:—Finely powdered benzoin is mixed with an equal weight of calcium hydrate and ten times its weight of water, the mixture is boiled slowly for some time and then filtered, the residue is washed with boiling water, the washings mixed with the filtrate and evaporated tc one-fourth of the original bulk, and when cold acidulated with strong hydrochloric acid, the precipitated benzoic acid is collected on a filter, re-dissolved in boiling water, agitated with charcoal, filtered and carefully evaporated, the crystals are dried between folds of bibulous paper and dissolved in a small quantity of ether, and set aside to crystallize. By this method the amount of benzoic acid existing naturally in benzoin can be estimated. From a number of samples recently examined by this process as much as 21 per cent. has been obtained, and the average of six estimations of Sumatra benzoin gave 17·8 per cent., but the acid was not examined for cinnamic acid, which occasionally accompanies benzoic acid, particularly in Siam and Penang benzoins. Benzoic acid, when prepared by sublimation, is mixed with its own weight of pumicestone or sand. On the large scale, it is heated and condensed in a chamber. On cooling, the benzoic acid condenses in shining needles having an aromatic and fragrant odour.

Benzoic acid is prepared on a large scale from coal tar products, *e.g.*, naphthalin and toluene, and also hippuric acid, a substance found in the urine of all herbivorous Mammalia. Benzoic acid melts at 120° C., and boils at 250° C. It is soluble in 200 parts of cold and 24 parts of boiling water; readily soluble in alcohol, ether, benzene, and oils.

Cinnamic acid is found in certain benzoins, and from Sumatra benzoin, Aschoff isolated 11 per cent. It melts at 133° C., boils at 290° C., and is with difficulty dissolved by cold water.

The fine tears of benzoin do not contain so much benzoic acid as the red coloured resin; they are principally purchased by the Greeks and Russians for use as incense.

Therapeutics.—Expectorant.

Official Preparations.—Acid Benzoicum; Adeps Benzoatus; Tinct. Benzoini Co.; and Ung. Cetacei.

OLEACEÆ.

No. 131. **Manna.** *Manna.*

A concrete saccharine exudation obtained by making transverse incisions in the stems of cultivated trees of Fraxinus Ornus (Ornus Europea).

Habitat.—The Manna, or Flowering Ash, is indigenous to countries bordering the Mediterranean and the islands of Sardinia, Corsica, and Sicily. It is also cultivated in Italy.

Collection.—When the tree has attained an age of eight or ten years, a horizontal incision is made to one-fifth of its circumference with a sharp knife. The incisions are first made on the side to which the tree inclines; from day to day a fresh incision is made until the branches are reached. The juice which flows from the incision is at first brownish, but on exposure to the air it becomes solid, whitish, and sweet, forming long stalactitic pieces. When the juice is very thin it is collected upon the leaves of Ficus Indica. It is collected once a week, and only in fine weather, the chief time being from July to September. A tree will yield manna for nine or ten years, after which it is removed and a young shoot planted in its place. The above description is that given by Janssen.

Characters.—Manna of commerce has various names applied to it, *e.g.*, large flake, small flake, and sorts. Flake manna consists of stalactitic pieces varying in length and thickness, flat and concave on the inner surface, where it adhered to the tree, of a pale yellowish-brown, or yellowish-white colour externally; it is friable, internally porous, and exhibits small cavities filled with minute crystals of mannite. Odour saccharine; taste, sweet and honey-like, with a faint bitterness and acridity. Manna in sorts is made up of the scrapings and droppings, and is met with in small pieces, with an adhesive brown-coloured surface, internally crystalline and whitish; it contains less mannite and more gum than the flaky sort. Manna is soluble in six parts of water, forming a clear faintly coloured solution. It yields to boiling alcohol about four-fifths its weight.

Composition.—Manna contains mannite as the chief component, with small quantities of sugar, resin, and gum, and about 9 to 12 per cent. of moisture.

Mannite. This hexatomic alcohol is the chief constituent of manna, and various qualities have yielded from 55 to 85 per cent. of this substance.

It can be prepared artificially by the action of nascent hydrogen, obtained from sodium amalgam, on dextrose or levulose; it is soluble in six parts of water, sparingly in alcohol, and insoluble in ether.

Adulteration.—Manna is rarely subject to sophistication, but a spurious article has been made of inferior manna worked up with gum or sugar; a sample recently examined was characterized by its snow-white appearance and sparing solubility in alcohol; on further examination it was found to consist of glucose with a small admixture of gum.

Therapeutics.—Laxative.

Oleaceæ.

No. 132. Oleum Olivæ. *Olive Oil.*

Synonym :—Sweet Oil.

A fixed oil expressed from the ripe fruit of Olea Europæa.

Habitat.—Indigenous to Western Asia and countries bordering on the Mediterranean; largely cultivated in Italy.

Preparation.—The fruit of the olive is an oval drupe, about an inch long, and of a dark purple colour when ripe; the sarcocarp contains a large amount of fatty oil, amounting to nearly four-fifths of its weight. Virgin or finest olive oil is obtained by gently pressing the fruit; the oil which oozes out is collected in cisterns containing water, from which it is removed by skimming; it is of a light amber-yellow colour and pleasant flavour. A second quality of oil is obtained by stronger pressure of the marc mixed with boiling water. An inferior oil is obtained from the fruit allowed to ferment in heaps. This is known as "Huile fermentée."

Olive oil is imported in barrels, in stone vessels, and in bottles. Tuscan oil, especially that from Lucca, is considered the best. Various methods are employed to decolourize the dark oils; nitric or sulphuric acids, or the alkalies ammonia or soda, are employed, or solution of potassium permanganate, and filtration through kaolin.

Characters.—Olive oil is a pale yellow or greenish-yellow oily liquid, with a faint agreeable odour, and a bland oleaginous taste, becoming slightly acrid. Its specific gravity at 60° F. is between ·915 and ·918; it congeals partially at 36° F. into a butyraceous consistency, but becomes quite solid at 26° F. It is soluble in ether, chloroform, carbon bisulphide, and sparingly in alcohol; it becomes nearly colourless on heating, and finally boils at 600° F.

Composition.—The fluid portion of olive oil consists of triolein, and the solids (of which about 30 per cent. may be separated by pressure from the congealed oil) of tripalmitin, triarachin, and possibly tristearin, with a minute quantity of cholesterin.

ASCLEPIADACEÆ

No. 133. Hemidesmi Radix. *Hemidesmus Root.*

Indian Sarsaparilla. Nannari.

The dried root of Hemidesmus Indicus.

Habitat.—Indigenous throughout India and Ceylon.

Characters.—In cylindrical, more or less twisted, longitudinally furrowed, thick, tortuous pieces, six inches or more in length; covered by a thin yellowish-brown corky layer, which is easily removed from the outer portion of the bark; it is transversely fissured, forming annulations. Odour fragrant and agreeable; taste sweetish and slightly acrid.

Composition.—No reliable analysis of hemidesmus root has been made, but according to Scott it yields a minute proportion of a volatile stearoptene. The cortex contains a little tannin, and the root contains starch.

Official Preparation.—Syrupus Hemidesmi.

LOGANIACEÆ.

No. 134. Nux Vomica. *Nux Vomica.*

Poison-Nut: Quakers' Buttons.

The seeds of Strychnos Nux Vomica.

Habitat.—This medium-sized tree is found growing throughout India, Burmah, Southern China, and the East Indian Islands.

Characters.—The fruit is a globular berry of a bright yellow colour, about the size of a Tangerine orange; primarily it is bilocular, but the dissepiments ultimately retrograde into a fleshy mass, indistinguishable from the central pulp of the fruit; the pericarp forms a thin, firm shell, enclosing a white gelatinous and intensely bitter pulp, in which the

Loganiaceæ.

seeds are found imbedded; the pulp is poisonous, containing strychnine and brucine.

The seeds are in the form of a rounded disc, about an inch in diameter and a quarter of an inch thick; they are sometimes flat, but generally have one side convex and the reverse concave, with thickened or occasionally acute edges; on the concave surface, and at its centre, is found the hilum, which is connected by the raphe to the chalaza; the raphe is frequently somewhat elevated, forming a ridge, which terminates in the rounded chalaza situated on the edge. The surface varies from a dull grey to a very silky yellowish-grey colour, due to numerous fine satiny hairs, which are closely adpressed, and radiate towards the circumference: in texture the seeds are hard and horny, the perisperm being of a yellowish-grey colour. When the seeds are macerated in water for some time, they become soft, and can then be easily split, upon which is seen the embryo, which is composed of two minute cordate cotyledons, which are seven-veined, the two outer veins being well marked and terminating in a rounded radicle. The seeds are inodorous, but have a persistent disagreeable taste; as they are with difficulty reduced to powder, they ought to be steamed for some time, then rapidly dried, and immediately comminuted in an iron mortar or drug mill.

Composition.—The fruit and seeds contain the alkaloids, strychnine and brucine, igasuric or strychnic acid, and a glucoside, loganin; the seeds, in addition, contain fat, protein compounds, to which the hard horny character of the perisperm is due, a little tannin, and sugar.

Strychnine. Various methods are employed in preparing this alkaloid; Henry's process consists in exhausting the drug with alcohol acidulated with sulphuric acid; Duflo's method is employed on a commercial scale. In principle the latter consists in extracting the drug by boiling with very dilute sulphuric acid, concentrating the decoction, and adding milk of lime, which precipitates colouring matter and alkaloids with calcium sulphate. The precipitate is washed with ice-cold water to remove colour, and then with very weak alcohol, which removes brucine, finally treated with boiling strong alcohol, which dissolves the strychnine ; this latter is purified by precipitation and recrystallization from spirit ; or the precipitate is boiled with 10 per cent. sulphuric acid, which removes the alkaloids as sulphates, the solution is decolorized, and the alkaloids precipitated by means of an alkali, the precipitate is collected, washed, and redissolved in boiling spirit, the strychnine separated by fractional crystallization, and the brucine allowed to crystallize from the mother liquor. The alkaloids can also be separated by resolution in 4 per cent. sulphuric acid, and then precipitating the strychnine as ferrocyanide by means of potassium ferrocyanide, decomposing the salt with ammonia, and crystallizing from alcohol. (Dunstan and Short.)

Strychnine forms tetragonal prisms, which are very sparingly soluble in water, ether, and absolute alcohol, more readily soluble in hot aqueous alcohol, chloroform, benzene, and amylic alcohol. It dissolves in dilute acids, neutralizing them and forming crystalline salts, which are more soluble in water, and on the addition of ammonium thiocyanate throw down a crystalline precipitate of strychnine thiocyanate. Strychnine and its salts are extremely poisonous, and from its intensely bitter taste no other alkaloid is likely to be mistaken for it.

Reactions of Strychnine.

1. To a neutral solution of the alkaloid add solution of potassium chromate.	Orange-yellow needles of strychnine chromate crystallize out.
2. Dissolve the alkaloid in strong sulphuric acid, then add a minute speck of potassium chromate, or use a crystal of strychnine chromate instead. (Guy.)	A deep rich blue colour, passing to purple, then orange-red.

Assay of Nux Vomica.—Take 10 grains of finely-powdered seeds, and pack in an extraction apparatus, and exhaust with chloroform containing one-quarter of its volume of alcohol. Exhaustion is known to be complete by quickly removing the receiver and fixing a fresh one, collecting the chloroform mixture, and agitating this with twice its volume of weak hydrochloric acid, removing the aqueous layer, and adding a solution of potassio-bismuthic iodide, when no precipitation will occur if all the alkaloid is removed. One hour's slow percolation is generally sufficient, after which the chloroform mixture is repeatedly agitated with weak hydrochloric acid, the acid solutions are mixed, ammonia is added in faint excess, and then 10 c.c. of chloroform; the whole is agitated, and the chloroform removed, poured on a tared dish, carefully evaporated on a water bath to dryness, cooled and weighed. The resulting weight of alkaloids multiplied by 10 will give the percentage. The highest recorded yield of alkaloids was 5 34 per cent. (Dunstan and Short.)

Official Preparations.—Ext. Nucis Vomicæ; Strychnina; Tinct. Nucis Vomicæ.

No. 135. Semen Ignatii. *St. Ignatius' Bean.*

Synonym :—Fabæ Sancti Ignatii.

The seed of Strychnos Ignatii (Strychnos Philippinensis, Ignatia amara).

Habitat.—A climbing plant indigenous to the Philippine Islands, and naturalized in Cochin-China.

Characters.—The seeds, of which from 18 to 24 are found imbedded in the pulp of the berry, are about one inch in length, oblong or ovoid, and by mutual pressure irregularly angular; the hilum is conspicuous at one end in a small depression. Internally the seeds are very hard and horny, with a minute cavity in the centre, into which projects the embryo, which consists of a rather long bent radicle and pointed cotyledons. Externally the seeds are of a dull brownish-grey colour, and when fresh are covered with silky hairs. Although different in outline, they are identical in botanical structure with the seeds of Nux

Loganiaceæ.

Vomica. The seeds are inodorous, and break under pressure with a granular and irregular fracture. They have a persistent disagreeable taste, and are extremely poisonous.

Composition.—St. Ignatius seeds contain the same constituents as Nux Vomica, but in different proportions, as much as 1·5 per cent. of strychnine having been recorded. (Geiseler.)

Commerce.—When met with in English markets they are quickly bought up for the preparation of the alkaloids.

No. 135a. Spigeliæ Radix. *Pinkwort.*

The dried root of Spigelia marilandiea, Carolina Pink.

Habitat.—Indigenous to the Southern States of America.

Characters.—The rhizome is about four inches long, slightly branched and twisted, with numerous rootlets, brown in colour, odour aromatic, taste bitter, the rootlets are much wrinkled. Sometimes the entire plant is used. The stem is about twenty inches long, with opposite ovate lanceolate leaves, and bearing a terminal spike of flowers.

Composition.—The root contains a volatile oil, tannin, resin, and a bitter principle.

No. 136. Gelsemium. *Yellow Jasmine or Carolina Jessamine.*

The dried rhizome and rootlets of Gelsemium nitidum. (Gelsemium sempervirens).

Habitat.—Indigenous to the Southern States of North America.

Characters.—The subterranean woody stem as met with in commerce is nearly cylindrical, and occurs in pieces of from one to six inches in length, and about half an inch in diameter; the stem breaks with a tough splintery fracture, the bark then showing the scattered silky fibres of its bast tissue; the wood is porous, pale yellow, and traversed with numerous light-coloured medullary rays, with a dark central pith; the true root is similar, but has no central pith. Odour slightly narcotic and aromatic; taste disagreeably bitter.

Composition.—Gelsemium contains a characteristic alkaloid gelsemine, and a peculiar acid gelseminic, besides a small quantity of volatile oil, resin, starch, and matter allied to pectin.

Official Preparations.—Ext. Gelsemii Alcoholicum; Tinct. Gelsemii.

No. 136a. Curare. *Curare.*

A soft extractiform mass, prepared probably from the bark of Strychnos Castalnanœna, and other poisonous plants.

Habitat.—South America; used as an arrow poison.

Characters.—As met with it is a soft black extract, with an intensely bitter taste, it is sparingly soluble in alcohol, insoluble in ether, but readily in water.

Composition.—This substance contains an alkaloid curarine, which is probably allied to strychnine; it is precipitated from its aqueous solution by platinic chloride; with nitric acid it gives a deep red, and with sulphuric acid and bichromate of potassium a violet colour.

GENTIANACEÆ.

No. 137. Gentianæ Radix. *Gentian Root.*

The dried root of Gentiana lutea.

Habitat.—It is indigenous to the mountainous districts of Central and Southern Europe.

Characters.—The root is more or less cylindrical, fleshy, and simple, in pieces or longitudinal slices, from a few inches to a foot or more in length, and nearly one inch thick. The upper portions of the roots are deeply annulated, the lower end being wrinkled; externally, the root varies from a dark greyish to yellowish-brown; internally, it is of a yellow or reddish-yellow colour; spongy, and has a peculiar heavy, characteristic odour; the central portion is separated by a very dark cambial zone. The root is flexible and tough; it tastes at first sweet, then intensely bitter. Its cold infusion is not coloured blue by the addition of a solution of iodine.

Composition.—Gentian root contains a peculiar bitter principle gentiopicrin, with gentisic acid, and about 15 per cent. of an uncrystallizable but fermentable sugar named gentianose. The root also contains a notable amount of pectin, but no starch.

Substitutes.—Frequently the roots of other species of gentians are collected; they possess similar properties. It is difficult to distinguish them, except when the plant is in flower. The following are the three principal ones used :—G. punctata, G. Pannonica, G. purpurea.

Official Preparations.—Ext. Gentianæ; Inf. Gentianæ Co.; Tinct. Gentianæ.

No. 138. Chirata. *Chiretta*

The dried entire plant Ophelia Chirata (Gentiana Chirata). Collected when the fruit begins to form.

Habitat.—An annual plant, indigenous to the hills of Northern India.

Characters.—The root is about 2 or 3 inches long, slightly tortuous, generally unbranched, of a light reddish-brown colour externally, brittle, the centre being hard and woody; the stem cylindrical in its middle and lower half, but four-sided towards the apex, nearly 3 feet long, branching dichotomously, smooth, brown or purple in colour. The leaves are opposite, sessile, ovate, five-nerved, in some samples absent. The flowers are numerous and small, arranged in racemose cymes. The fruit is a capsule, surrounded by the persistent calyx, and contains numerous seeds. The whole plant is inodorous, and has a marked bitter taste.

It is generally imported in bundles, tied up with strips of bamboo.

Convolvulaceæ.

Composition.—Chiretta contains two bitter principles, ophelic acid and chiratin, which were isolated by Höhn.

Official Preparations.—Inf. Chiratæ ; Tinct. Chiratæ.

CONVOLVULACEÆ.

No. 139. Scammoniæ Radix. *Scammony Root.*

The dried root of Convolvulus Scammonia.

Habitat.—The Scammony plant is found in Asia Minor, Syria, and Greece.

Characters.—The root varies in size and length, is unbranched, cylindrical, tapering, and more or less twisted, and at the top presents the remains of numerous slender aërial stems ; it is furrowed longitudinally, and covered with a greyish-brown bark ; pale brown or white internally, and when broken numerous fragments of pale yellow resin are found on the fractured surface. It is hard and woody, with a faint nauseous odour and taste slightly resembling jalap.

Composition.—The root contains about 5 per cent. of the scammony resin, and is said to contain most resin prior to the flowering of the plant ; it also contains a small quantity of tannin and about 12 per cent. of sugar. The resin can be readily extracted by percolation with spirit and recovering the spirit by distillation, when it is left as a residue.

Official Preparation.—Scammoniæ Resina.

No. 140. Scammonium. *Scammony.*

A gum-resinous exudation obtained by incision from the living root of Convolvulus Scammonia, hardened in the air.

Collection.—The brushwood amongst which the plant grows is first cleared, and the soil removed so as to expose a portion of the root ; this is then cut in a slanting direction and a mussel shell stuck into it below the lower

Convolvulaceæ.

edge. The shells are generally collected in the evening, and the surface of the root scraped to remove any resin; the contents of the shells being usually emptied into a pot, stirred until homogeneous, and then exposed to the air to dry. Frequently the mass is softened by exposing it to the sun, it is then kneaded into a plastic mass, and during this process considerable sophistication is carried on, the principal addition being flour or earthy matter, after which it is spread out in masses and dried. The bulk of the Scammony of commerce is collected near Smyrna and Aleppo.

Characters.—As met with in commerce Scammony occurs in angular or circular cakes, varying in size, ashy grey or brownish-black externally, and occasionally covered with a greyish-white powder. It is very brittle and breaks with a splintery fracture, the broken surface being resinous, shiny, and porous, and of a dark greyish-black colour; the powder when triturated with water forms a smooth greenish emulsion. Odour peculiar, sour and cheesy; taste acrid, producing a tingling of the fauces. A cold decoction gives generally a blue colour with iodine, which is slight; when treated with ether it ought to lose four-fifths of its weight.

Composition.—Scammony consists principally of resin, which varies between 50 and 95 per cent.; good scammony ought to contain at least 75 per cent.: the remainder being gum, with a little mineral matter.

The resin consists almost entirely of scammonin with a little colouring matter. Scammonin is the anhydride of scammoninic acid, and is decomposed, on boiling with dilute acids, into scammoniolic acid and glucose. Scammony resin when pure is of a brownish colour, becoming a pale buff on treatment with charcoal; it is glossy and very brittle; it has a sweetish odour, but is almost tasteless, and when triturated with water it does not form an emulsion. It is entirely soluble in ether, turpentine, alcohol, and solution of potassium or ammonium hydrate, and the solution, on the addition of an acid, remains clear. Its alcoholic solution does not acquire a green colour on addition of chlorine water, nor does it colour the fresh-cut surface of a potato (absence of guaiacum resin).

Convolvulaceæ.

Assay of Scammonium.—Take 5 grams of previously dried and finely powdered scammony, mix it with an equal bulk of powdered pumice, and percolate the mixture with ether until exhausted, then distil off the ether and weigh the residue, which multiplied by 20 gives the percentage of resin.

Therapeutics.—A drastic purgative.

Official Preparations.—Mist. Scammonii, and Resina Scammoniæ.

No. 141. Jalapa. *Jalap.*

The dried tubercules of Ipomea purga (Exogonium Purga).

Habitat.—The plant is indigenous to the Mexican Andes, and is cultivated in Jamaica and on the Nilgherry Mountains in India, 7 braz

Collection.—The tubercules are collected during the whole year, but more particularly in spring, and as drying by exposure to the sun's heat is almost impossible on account of the wet climate, they are strung on pieces of cord, and suspended from the top of the Indian's hut, and are more or less smoke-dried. The smaller pieces are dried entire, but the larger tubercules are either split longitudinally or sliced to facilitate the drying. The bulk of the jalap is imported in a bad condition, being mouldy and otherwise unfit for use, owing to imperfect drying.

Characters.—The tubercules are irregularly oblong, somewhat ovoid, napiform or depressed globose, sometimes pyriform or nearly cylindrical, varying in size from that of a walnut to a man's hand. Externally they are dark brown with a smoky appearance, irregularly furrowed and wrinkled, marked with short paler transverse lines and numerous broad corky warts; internally they have a brown or dirty yellowish-brown colour, and are marked with irregular concentric rings. The bark is easily removed after macerating in water; on the inner surface numerous resin cells are visible. Jalap has a peculiar smoky sweetish odour, increased on rubbing; the taste is nauseous and acrid. Good jalap should be ponderous, hard and compact, and should break with resinous fracture.

Composition.—Jalap contains a characteristic resin, with gum, sugar, and starchy matter.

The amount of resin varies in different samples of jalap, as much as 22 per cent. having been obtained; but the average ranges between 12 and 18 per cent., and ought not to be under 10 per cent. It is composed of two bodies, one being soluble in ether, and the other insoluble; the latter is the chief constituent, amounting to about 90 per cent. of the resin. This insoluble portion is the convolvulin of Mayer and the rhodeoretin of Kayser.

Substitutes.—Occasionally other varieties of jalap are met with, more particularly the tubercules of Tampico Jalap obtained from Ipomea simulans. In appearance it closely resembles true jalap, but occurs in more elongated tuberous pieces, deeply wrinkled, and destitute of the small scars found on true jalap. It yields from 12 to 15 per cent. of resin almost entirely soluble in ether. (Umney.)

The Male or Woody Jalap consists of the tubercules of Ipomea Orizabensis. It is paler in colour, compact, broad, and of a fibrous texture and deeply wrinkled longitudinally. It yields nearly 12 per cent. of resin, which is soluble in ether.

Assay of Jalap.—Take 10 grams of finely-powdered jalap and percolate it with warm alcohol until exhausted, concentrate the tincture and pour the residue into water, collect the precipitated resin, wash, dry, and weigh. The weight multiplied by 10 will give the percentage. Macerate the residue with ether for twelve hours, decant the ether; then dry the residue on a water bath; the loss ought not to exceed 10 per cent.

Therapeutics.—A brisk purgative.

Official Preparations.—Ext. Jalapæ; Pulv. Jalapæ Co.; Pulv. Scammonii Co.; Resina Jalapæ; and Tinct. Jalapæ.

SOLANACEÆ.

No. 142. Stipites Dulcamaræ. *Dulcamara.*

Synonym :—Bittersweet, Woody Nightshade.

(Not official.)

The young stems and branches of Solanum Dulcamara.

Habitat.—Indigenous throughout Europe. Found in Asia Minor and North Africa. Naturalized in North America.

Characters.—The stems and branches of the older portions are woody, and only the shoots of the younger parts ought to be collected when about two years old. They are two or three feet in length, cylindrical, furrowed longitudinally, and marked with small warts. The corky layer is of a pale greenish-yellow colour, and easily exfoliates, exposing a dark green bark. In the older pieces the wood is porous and marked with fine medullary rays, the stalks are mostly hollow, or contain a white pith. Odour disagreeable when fresh; taste at first bitter, then sweetish.

Composition.—Bittersweet contains a glucoside dulcamarin, dulcarin, or picroglycion, and two doubtful alkaloids, solanine and dulcamarine.

Adulteration.—Occasionally the cut stems and branches of the honeysuckle and hop have been found in dulcamara, but on comparison with the above characters are easily recognized.

Therapeutics.—Alterative.

No. 143. Capsici Fructus. *Capsicum Fruit.*

Synonyms:—Guinea, Cayenne, African, Red, and Pod Pepper.

The dried ripe fruit of Capsicum fastigiatum.

Habitat.—Supposed to be indigenous to South and Central America, and to have been introduced to India and

Africa by the Portuguese. It now grows wild in Southern India, and is largely cultivated in tropical Africa.

Characters.—The fruit, which is a two-celled berry, is about three-quarters of an inch in length, supported by a flattened calyx. It is somewhat shrivelled, conical-oblong, obtuse, and composed of a smooth, bright scarlet, brittle, thin pericarp, which is translucent, enclosing two cells, containing (attached to the thick central placenta) numerous reniform, yellowish seeds, slightly thickened at the edges. The embryo is semicircular, and enclosed in succulent perisperm. Odour peculiar and pungent, and the taste of both pericarp and seeds is extremely pungent and fiery. This is the only variety allowed by the British Pharmacopœia.

Composition.—Capsicum fruit contains a volatile alkaloid, a crystalline body capsaicin, a red colouring principle, a fat, and minute traces of a volatile oil.

Allied Varieties of Capsicum.—Capsicum annuum yields the large fruits known as Pod Pepper, which are largely used in this country. They are much larger, being from 1 to 4 inches in length, and more or less conical; on drying they acquire a brownish-red colour. The plant is a native of South America. Capsicum longum and C. grossum are only varieties of C. annuum.

Adulteration.—Cayenne pepper is principally adulterated with red mineral powders, chiefly brick dust and red lead. They are easily detected by the increase in the percentage of ash, which should not exceed 6 per cent. Starches are sometimes met with. They are best recognized by the microscope.

Therapeutics.—Powerful stimulant and rubefacient.

Official Preparation.—Tinctura Capsici.

No. 144. Belladonnæ Folia. *Belladonna Leaves.*

Deadly Nightshade, Dwale.

The fresh leaves of Atropa Belladonna with the branches to which they are attached; also the leaves, separated from the branches and carefully dried, gathered when the fruit has begun to form, from plants growing wild, or cultivated in Britain.

Habitat.—The plant is a native of Central and Southern Europe; it is cultivated throughout Europe, and in some districts in North America.

Characters.—The forked herbaceous stem bears on the upper branches numerous bright green leaves in unequal pairs surrounding the solitary dull purple flower. They are broadly ovate with an entire margin, smooth, and from three to six inches long. On drying they lose a little over 80 per cent. of their weight, and become thin and friable, assuming a brown colour on the upper surface, and greyish green on the under. Odour, which when fresh is heavy and disagreeable, is lost on drying; taste, nauseous and bitter.

Composition.—The leaves contain the alkaloid atrophine, but in smaller amount than the root, according to Lefort about ·4 to ·5 per cent.

Admixtures.—The leaves of Solanum nigrum have been found amongst those of belladonna; they are smaller, and the margin usually repand-dentate. In samples of carelessly gathered belladonna leaves, the leaves of hyoscyamus and digitalis are sometimes found, but they are readily distinguished from the belladonna by their hairy appearance and outline.

Official Preparations.—Ext. Belladonnæ; Succus Belladonnæ; Tinct. Belladonnæ.

No. 145. Belladonnæ Radix. *Belladonna Root.*

The root of Atropa Belladonna from plants growing wild or cultivated in Britain, or imported in a dried state from Germany.

Characters.—Belladonna Root is generally collected from plants two or three years old, and is a foot or more in length, and from one to two inches in thickness. When fresh it is cylindrical, tapering and fleshy, but when dry it is deeply wrinkled. The upper end is marked with the hollow bases of the stems; externally, it is rough and of a dirty grey colour; internally, whitish. It breaks readily with a short fracture; a transverse section shows a thin cortical portion of a yellowish or pale brown colour, separated by a dark line from the central portion of a light brown colour, marked with numerous dark-coloured dots; the wood bundles are arranged in radiating lines. When fresh the root has a nauseous odour; taste, bitterish and acrid.

Composition.—The most important constituent of the whole plant is the alkaloid atrophine, of which the roots contain nearly ·5 per cent.; they also contain hyoscyamine, belladonnine, a colouring principle atrosin, malic acid, and a minute quantity of a soft fatty principle, probably butyracin.

Therapeutics.—Anodyne and cardiac stimulant.

Official Preparations.—Atropina; Linimentum Belladonnæ; Ext. Belladonnæ Alcoholicum.

No. 146. Stramonii Semina. *Stramonium Seeds.*

The dried ripe seeds of Datura Stramonium.

Habitat.—Found growing throughout Europe, Asia, and America.

Characters.—The seed-vessel is a spiny ovoid capsule, opening at the apex into four valves, and having two spurious dissepiments, which do not reach the top of the capsule. When the pericarp separates the seeds are found attached to the central columella. When ripe the seeds are brownish-black in colour, reniform, flattened, the testa being finely pitted, and coarsely reticulated; the hilum is situated on the sinus. The testa is hard, and encloses an oily perisperm, in which the round embryo is embedded. The seeds are inodorous, but when bruised emit a heavy disagreeable odour; the taste is oily and bitter.

Composition.—Stramonium seeds contain the alkaloid daturine, a peculiar principle stramonin, about 25 per cent. of a fixed fatty oil, and small quantities of mucilaginous and resinous matter. The seeds on incineration yield nearly 3 per cent. of ash.

Therapeutics.—The same as Belladonna.

Official Preparations.—Ext. Stramonii ; ~~Tinct. Stramonii.~~

No. 147. Herba Stramonii. *Stramonium.*

Synonym :—Thornapple.

The dried young shoots and leaves of Datura Stramonium.

Collection.—The stramonium produces an upright herbaceous stem, which throws off numerous branches bearing the leaves and white flowers; for medicinal purposes the leaves and young shoots are chiefly employed. The leaves are situated on long petioles, and are unequal, varying from 3 to 8 inches in length, ovate, unequal at the base, one side being somewhat decurrent on the petiole; the apex is acuminate, the margin irregularly sinuate-dentate. The older leaves are glabrous, the young ones downy. When recently collected the leaves have a disagreeable nauseous odour, and are somewhat fleshy, but after drying they become thin and brittle, lose the fœtid odour, and are of a greyish-green colour; taste saline and bitter.

Composition.—The leaves, as well as the whole plant, contain daturine, but in minute quantities, and when incinerated yield 17 per cent. of ash, of which nearly one-half is soluble in water.

Allied Plant :—

Datura Tatula closely resembles the official plant, but is distinguished by its purple-coloured stem and violet flowers.

No. 148. Hyoscyami Folia. *Henbane Leaves.*

The fresh leaves and flowers, with the branches to which they are attached, of Hyoscyamus niger; also the leaves separated from the branches and flowering tops carefully dried. Collected from biennial plants growing wild or cultivated in Britain, when about two-thirds of the flowers are expanded.

Habitat.—Indigenous throughout Europe, Northern India, and Egypt, naturalized in North America and Brazil. In Britain it is found growing in waste places, but is cultivated in several counties, Lincoln, Herts, Surrey, Kent, &c., for medicinal purposes.

Characters.—Henbane being a biennial plant, it is essential that only the biennial leaves be used in preparations. The leaves taken from the lower part of the stem are stalked, whilst those on the upper branches are sessile and amplexicaul; they vary in length, the larger leaves being nearly a foot long; they are exstipulate, triangular-ovate, acute, sinuate-dentate, pale green, glandular, hairy, particularly on the under surface and on the veins; when fresh they are clammy, with a strong heavy odour; taste, somewhat bitter and acrid.

Composition.—Henbane leaves contain the alkaloids hyoscyamine and hyoscine, together with a peculiar odorous principle, malic acid, gum and sugar. The seeds, in addition, contain a glucoside hyoscypicrin and an acid resin.

Other Species of Hyoscyamus :—

Hyoscyamus agrestis (H. annua). An annual variety, rarely exceeding a foot in height: it bears fewer flowers of a pale yellow colour, and the leaves are nearly smooth.

Hyoscyamus albus, a slender plant with more obtuse leaves. The leaves are collected in Southern Europe in place of H. niger, var. biennis; they are less active.

Adulteration.—Considerable quantities of Stramonium leaves have recently been imported as exotic henbane; an examination of the above characters will readily distinguish them.

Therapeutics.—Anodyne and cardiac stimulant, the same as belladonna, but the plant is milder in its action.

Official Preparations.—Ext., Hyoscyami; Succus Hyoscyami; Tinct. Hyoscyami.

Solanaceæ.

No. 149. Hyoscyami Semen. *Henbane Seed.*

(Not official.)

The ripe seeds of Hyoscyamus niger from wild or cultivated plants.

Habitat.—They should be obtained from plants growing in this country.

Characters.—The capsule (pyxis) is surrounded by the persistent bell-shaped calyx, and is about half an inch in length, dehiscing near the top in a transverse manner; it is bilocular, and contains numerous seeds. The seeds are small, roundish or reniform, flattened, the testa is roughly pitted, and of a greyish-brown colour, enclosing a white oily perisperm, in which is embedded the curved embryo; the hilum is situated on the concave side. They are inodorous, and have an acrid, oily, bitterish taste.

Composition.—They contain the alkaloids hyoscyamine and hyoscine in greater quantity than any other part of the plant, and are principally used for the preparation of hyoscyamine. There is also a considerable amount of a bland, fatty oil to the extent of 25 per cent., which is partly soluble in alcohol.

They were official in the older Pharmacopœias.

No. 150. Tabaci Folia. *Tobacco Leaves.*

(Not official.)

The commercial dried leaves of Nicotiana Tabacum.

Habitat.—Indigenous to tropical America. It is cultivated in all sub-tropical countries.

Characters.—The leaves of the tobacco plant vary considerably in size; those situated on the lower part of the stem are about two feet long and six inches wide, the upper leaves being much smaller; ovate, ovate-lanceolate, or oval-oblong, pointed and acute at the apex, with an entire margin, and a thick and prominent midrib, and in the fresh condition they are covered with numerous viscid hairs. Colour, when fresh, bright green; odour narcotic; after drying they become brown, brittle, thin, and more or less mottled; odour heavy; taste nauseous, bitter, and acrid.

When cultivated, the leaves and flowering tops are generally collected in September, just before the flowers open; they are then dried and stripped from the stalks, and packed in boxes or hogsheads.

Composition.—Tobacco leaves contain an alkaloid nicotine, a peculiar body nicotianin, sugar, fat, tannin, and a large quantity of salts.

SCROPHULARIACEÆ.

[illegible] [illegible] Juice [illegible]

No. 151. Digitalis Folia. *Foxglove Leaves.*

The leaves of Digitalis purpurea. Collected from wild British plants of the second year's growth, when about two-thirds of the flowers are expanded and carefully dried.

Habitat.—Indigenous throughout Southern and Central Europe.

Characters.—Foxglove is a biennial or perennial plant; the leaves differ in size according to their situation; the radical leaves are the largest, being often one foot or more in length, and ovate or ovate-lanceolate in outline; the stem leaves are smaller, and the petioles shorter, the petiole is winged and sometimes purplish in colour. In all the leaves the margin is irregularly and doubly crenate or subserrate, the upper surface is wrinkled, of a dull green colour, slightly downy, the under surface a pale grey, densely pubescent and reticulated, with prominent veins; the midrib is broad at the base, tapering to a fine point, and of a purple colour. Taste bitter and unpleasant; odour faint, tea-like, but agreeable.

Composition.—Digitalis leaves contain a characteristic class of glucosides known as the digitalins, the more important being digitalin, digitonin and digitalein; they also contain digitin and digitacrin, a peculiar fatty body, a sugar inosite, gum, and chlorophyll.

Labiatæ.

Adulteration.—Foxglove leaves are sometimes mixed with the leaves of one or more species of Verbascum; these are easily distinguished by their thick covering of stellate hairs; the leaves of Inula Conyza are recognized by the smaller veins being less prominent, and by the lateral veins at the base not being decurrent into the petiole, as is the case in digitalis.

Therapeutics.—A cardiac sedative and tonic.

Official Preparations.—Inf. Digitalis; Tinct. Digitalis.

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tem tinged with purple stalk leaves

LABIATÆ.

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No. 152. Menthæ piperitæ Herba. *Peppermint.*

The dried tops and leaves of Mentha piperita.

Habitat.—Found wild throughout Central and Southern Europe and North America. Largely cultivated in England, United States, Germany, and France.

Characters.—The stem is erect, firm, and angular, slightly pubescent and frequently tinged with purple. The leaves are petiolate, from two to three inches in length, varying in shape from lanceolate to ovate, slightly rounded at the base, the apex narrow and acute; the surface is dark green above, paler beneath and glandular. The inflorescence consists of about fourteen whorls, the lower ones being somewhat apart, each whorl containing about twenty flowers; in the upper whorls the flowers are crowded together. The flowers are purplish, with the corolla protruding, the fruit consists of four rugose achenia. The entire plant has an aromatic odour, and strong pungent and cooling taste.

This plant is distinguished from Mentha viridis by its stalked leaves, and obtuse less tapering inflorescence. Bentham considers it a variety of M. hirsuta.

Composition.—The principal constituent is the essential oil, but besides this it contains a little tannin.

The Essential Oil is obtained by distilling the fresh flowering tops with water, or, preferably, by passing a current of steam through the crushed drug.

Adulterations.—The oil is sometimes adulterated with alcohol, castor oil, and turpentine; the American oil may accidentally contain oil of erigeron.

Tests.—Iodine, when added to the oil, should have little or no action (absence of turpentine). The oil should be easily soluble in three parts of spirit (absence of castor oil and turpentine). Dropped on paper, it should leave a translucent stain, which should disappear in a few minutes (absence of castor oil). When agitated with twice its volume of warm glycerine it should not diminish in volume on separating (absence of alcohol). If oil of erigeron be present, the oil will have a rank hemlock-like odour, and is acted on violently by iodine.

Therapeutics.—Aromatic.

Official Preparations of the Oil.—Aq. Menthæ Piperitæ; Ess. Menthæ Pip.; Sp. Menthæ Pip.

$C_{10}H_{19}OH$.

No. 153. Menthol. *Menthol or Mint Camphor.*

A stearoptene obtained by cooling the oil distilled from the fresh herb of Mentha arvensis, vars. piperascens and glabrata, and of Mentha piperita.

Habitat.—Mentha arvensis is found growing wild in Japan and China, and the oil is largely distilled for the preparation of Menthol.

Characters.—Menthol occurs in acicular crystals or in crystalline masses, sometimes moist from adhering oil; those obtained from M. piperita are snow white and acicular, and are nearly always moist, while those from the oil of M. arvensis are firm and more or less transparent. The two differ slightly in their physical properties, but are chemically the same (Trimble). The melting point should lie between 108° and 110° F.; taste warm, camphoraceous, and aromatic; odour resembling the oil. When rubbed on the skin menthol first produces extreme cold, then a tingling numbness.

Composition.—Menthol is a monohydric alcohol, con-

Labiatæ.

taminated more or less with the neutral hydrocarbons of the oil.

Adulterations.—Menthol has been subjected to considerable adulteration, chiefly with phenol, thymol, salicylic acid, spermaceti, and magnesium sulphate.

Tests.—A little wrapped in paper and placed on a water-bath should leave no residue or oily stain. Dissolve a little in glacial acetic acid and gradually add six drops of strong sulphuric acid, then a drop of nitric acid; thymol, if present, will give a green changing to a fine blue; and a violet colour is produced if phenol is present (Eykman). When agitated with water the solution should not give a violet colour with neutral ferric chloride (absence of salicylic acid). Spermaceti or wax, if present, will increase the melting point.

Therapeutics.—Antiseptic and anæsthetic.

No. 154. Menthæ viridis Herba. *Spearmint.*

green stem
Crook leav

The dried leaves and tops of Mentha viridis.

Habitat.—Indigenous to England and the greater part of Europe, and cultivated largely in the United States.

Characters.—The stem is two or three feet in height, erect, angular, firm, and branching below; green, but sometimes tinted with purple, and somewhat pubescent at the nodes. The leaves are sessile; a few of the lowest have short petioles; they are from two to three inches in length, lanceolate, smooth, acute, and serrate; midrib prominent and purple on the under surface, which is also densely glandular. The inflorescence is in panicled narrow spikes consisting of whorls, or more strictly speaking, verticillasters, containing about fifteen flowers in each. The flowers are purplish, tubular, or bell-shaped; the corolla is exserted, and twice the length of the calyx. The fruit consists of four smooth achenia. Spearmint has an aromatic odour and taste, resembling that of peppermint, but much less pungent.

Composition.—The plant contains a volatile oil and a little tannin.

Labiatæ.

The Essential Oil is obtained by steam distillation, and the plant yields about ·5 per cent. It is colourless, pale yellow, or greenish-yellow, becoming reddish-brown by age; when fresh it dissolves in all proportions of alcohol without becoming opalescent.

Production.—Oil of Spearmint is seldom distilled in England; it is principally prepared in the United States. The German is prepared from Mentha aquatica, var. crispa, and is inferior to the true oil.

Therapeutics.—Aromatic.

Official Preparation of the Oil.—Aqua Menthæ Viridis.

No. 155. Pulegii Herba. *Pennyroyal.*

(Not official.)

The dried tops and leaves of Mentha Pulegium.

Habitat.—Indigenous to Europe; cultivated in South and North America.

Characters.—The stem is small and decumbent, about six inches in height. The leaves are about an inch long, petiolate, ovate; margin crenate; apex obtuse, densely glandular on both surfaces. The inflorescence is arranged in whorls, and extends some distance along the stem. Pennyroyal has a strong aromatic odour and taste.

Composition.—The entire plant contains the essential oil, which is of a pale yellow colour.

Production.—Oil of Pennyroyal is chiefly prepared in Germany and France. American Pennyroyal is Hedeoma pulegioides.

No. 156. Thymi vulgaris Herba. *Garden Thyme.*

The dried leaves and branches of Thymus vulgaris.

Habitat.—Indigenous to Southern Europe, cultivated in England as a garden plant.

Characters.—The plant has a suffriticose stem bearing

Labiatæ.

leaves about half an inch in length, linear or ovate oblong, with revolute margins, greyish-green in colour, pubescent on the under surface, and dotted with numerous oil glands. The flowers are reddish, and arise from the axils of the leaves. The whole plant is characterized by a white pubescence; it is fragrant when rubbed, and has a pungent, aromatic taste.

Composition.—It contains an essential oil, which is the only constituent that has been examined.

The Essential Oil is distilled principally in France, by means of steam, from the entire plant; when first prepared it is of a reddish-brown colour, which on re-distillation is colourless, or of a pale yellow. It has a warm, aromatic taste, and is soluble in its own volume of alcohol. It is composed of thymol, cymene, and thymene.

No. 157. Lavandulæ Flores. *Lavender flowers.*

The dried flowers of Lavandula vera.

Habitat.—It is a native of Southern Europe, and is cultivated in most European countries, and in the United States.

Characters.—The flowers are borne on loose terminal spikes arranged in whorls, which arise from the axil of rhomboidal bracts. The calyx is tubular and contracted at the mouth, and is thirteen-nerved; it is densely covered with minute hairs and glands, and is of a bluish-grey colour. The corolla protrudes from the mouth of the calyx; it is of a violet colour, tubular, pubescent and glandular on the outside, and bilabiate, the upper lip being two-lobed. Inside the throat of the corolla the stamens are situated. Lavender flowers have an agreeable and fragrant odour, which is more evident when rubbed; taste aromatic and bitterish.

Composition.—The flowers contain resin, tannin, and an agreeable volatile oil, of which the fresh flowers yield about 1 per cent.

The essential oil is distilled from the flowers alone, or from the flowering tops, or from the entire plant by means of steam. That obtained from the flowers is the most fragrant and esteemed; the leaves and stalks yield a fragrant but ranker oil. The oil is of a pale yellow colour, or nearly colourless, and becomes viscid and acid on keeping; it is soluble in all proportions of strong alcohol, and on the addition of iodine it detonates slightly, with a rise of temperature. It is composed of a neutral hydrocarbon, and a body closely related to camphor.

Production.—Oil of Lavender is principally distilled in the neighbourhood of Hitchin, in Hertfordshire, and Mitcham, in Surrey, where the yield is about 9 to 12 pounds weight per acre.

No. 158. Rosmarinus. *Rosemary.*

The dried leaves of Rosmarinus officinalis.

Habitat.—Indigenous to Southern Europe and Asia Minor; cultivated in England.

Characters.—Rosemary leaves are about an inch long, entire, linear and opposite, margins revolute, obtuse at the ends, dark green on the upper surface, densely woolly and dotted with oil glands beneath. On drying, the leaves become more rigid, and of a paler colour. The plant has an agreeable aromatic odour, and a strong camphoraceous pungent taste.

Composition.—The leaves contain a bitter principle, resin, tannin, and essential oil.

The Essential Oil is prepared from the entire plant, but a finer oil is obtained when the flowers alone are used; it is distilled by passing a current of steam through the crushed herb. The oil is almost colourless, with a warm, camphoraceous taste, and is soluble in its own weight of alcohol.

Production.—Oil of Rosemary is chiefly prepared in the South of France, and in the island of Lesina, south of Dalmatia, whence it is exported by Trieste.

Therapeutics.—Rubefacient.

Official Preparation of the Oil.—Spiritus Rosmarini.

No. 159. Marrubii Herba. *Horehound.*

The dried leaves and tops of Marrubium Vulgare.

Habitat.—Indigenous to Eastern Europe ; cultivated in this country.

Characters.—The stem is about twelve or fourteen inches high, four-sided, and covered with fine white hairs. The leaves are opposite and about one inch long, slightly cordate and prominently veined, pale green and downy on the upper surface, whitish beneath. The flowers are in dense whorls, and have a white corolla. The entire plant has a strong odour and bitter taste.

Composition.—The plant contains a volatile oil, resin, tannin, and a bitter principle.

BORAGINACEÆ.

No. 160. Alkannæ Radix. *Alkanet Root.*

(Not official.)

The dried root of Alkanna tinctoria (Anchusa tinctoria).

Habitat.—Southern Europe and Western Asia ; cultivated throughout the South of Europe.

Characters.—Alkanet root is nearly a foot in length, divided, and crowned with the remains of the leaf stalks. The cortex is thin, and easily separated, and of a purplish colour ; the central portion is spongy in texture, and of a reddish-brown colour ; it is inodorous and tasteless.

Composition.—The root contains a characteristic colouring principle, anchusin, or anchusic acid.

Sub-Class MONOCHLAMYDÆ.

POLYGONACEÆ.

No. 161. Rhei Radix. *Rhubarb Root.*

The root, more or less deprived of its bark, sliced and dried, of Rheum palmatum, var. Tanguticum; Rheum officinale: and probably other species.

Habitat.—The rhubarb plants are natives of Northern and Western China, South-Eastern Thibet, and throughout the highlands of Central Asia. Other varieties are cultivated in Austria, England, and France.

Characters.—Rhubarb root, as met with in commerce, consists of pieces of the rhizome cut transversely or longitudinally, and known as East Indian rounds and flats. They occur in somewhat cylindrical, conical, plano-convex, or irregularly-formed pieces; they are frequently perforated with a small hole, in which is found the remains of the cord used for suspending the pieces when drying. The outer surface is frequently marked with small patches of the inner portion of the corky layer, and is carefully trimmed and smooth: sometimes slightly wrinkled, and usually covered with a bright yellowish-brown powder; on removal of the powder it is a rusty-brown colour, marked with dark rusty-brown striæ. When broken or cut transversely it presents a marbled appearance, in which the yellowish-white parenchyma is seen to be traversed with numerous reddish lines which are very irregular and radiate towards the circumference; near the cambial zone numerous star-like spots are seen, which consist of the ends of the medullary rays; these spots are also found throughout the root. Rhubarb ought to be hard and compact, and break with an uneven and granular fracture; odour slightly aromatic and peculiar; when chewed should taste gritty, and impart a yellow colour to the saliva.

Composition.—Rhubarb contains phæoretin, chrysophan, emodin, cathartic acid, and rheotannic acid, besides variable quantities of calcium oxalate, fat and pectinaceous matter.

The root on incineration leaves about 14 per cent. of ash, but as much as 43 per cent. has been obtained. (Flückiger and Hanbury.)

Adulteration.—Powdered rhubarb is frequently mixed with the powder of English rhubarb, and sometimes with turmeric.

Polygonaceæ.

Test.—Place a little of the powder on white bibulous paper and moisten it with chloroform; after a few minutes remove the powder; turmeric or European rhubarb, if present, will have formed a deep yellow stain; good Chinese rhubarb only gives a light yellow. Moisten the stain with a solution of borax, and then a drop of strong hydrochloric acid; turmeric, if present, will be indicated by a change to a bright red; the stain from genuine rhubarb not being affected. (Howie.)

Therapeutics.—Stomachic in small doses; purgative in large doses.

Official Preparations.—Ext. Rhei; Inf. Rhei; Pil. Rhei Co.; Pulv. Rhei Co.; Syr. Rhei; Tinct. Rhei; Vin. Rhei.

No. 162. **Rhei Radix Anglica.** *English Rhubarb Root.*

(Not official.)

The root, scraped, sliced and dried, of Rheum Rhaponticum and Rheum officinale.

Habitat.—Cultivated at Bodicote in Oxfordshire.

Characters.—The root of R. officinale is found in flat, concavo-convex, or cylindrical pieces. The outer surface is marked with numerous deep longitudinal furrows and conspicuous veins. Usually a small round hole is bored through each piece to imitate Chinese Rhubarb; the fracture is granular, showing a compact structure traversed with numerous deep-coloured veins, and marked with star-like spots; odour strong and aromatic; when chewed, the root has a gritty taste.

The root of R. Rhaponticum occurs in semi-cylindrical pieces, marked with numerous and deep longitudinal furrows, and is of a light reddish-yellow colour; the fractured surface is pale pink, soft and spongy, the medullary rays running nearly regular to the centre. Odour feeble, taste astringent, mucilaginous, somewhat bitter, and gritty. The cylindrical pieces are the upper segments of the lateral roots, and the "Stick" rhubarb consists of the lower segments.

Myristiceæ.

Production.—The roots are seldom dug up until they are four years old; and the longer they are allowed to remain the better the quality. After digging they are lightly washed to remove earth, then peeled and sliced into pieces of suitable size, and dried first in a current of air and afterwards in a warm room. The shrunken appearance is partly remedied by a second paring, after which the drug is stored in a warm, dry place.

Composition.—In composition it is almost identical with the Asiatic rhubarb, but rarely yields more than 10 per cent. of ash, which chiefly consists of carbonates of potassium and calcium.

Commerce.—English rhubarb is principally exported, very little being used in this country.

No. 163. Bistorta. *Bistort, Snakeweed.*

(Not official.)

The dried rhizome and rootlets of Polygonum Bistorta.

Habitat.—Found growing throughout Asia, Europe, and North America.

Characters.—The rhizome is very irregular and usually bent backwards upon itself, transversely annulated from the remains of leaf scars, flat on one side and round on the other, marked with the scars of rootlets. Externally it is black or blackish-brown; internally, brownish-red. Texture firm and compact. Taste strongly astringent and slightly bitter.

Composition.—Snakeweed owes its astringent properties to tannic acid, of which Bowman found 21 per cent.

MYRISTICEÆ.

No. 164. Myristica. *Nutmeg.*

The dried seed of Myristica fragrans (Myristica officinalis) divested of its hard coat or shell.

Myristiceæ.

Habitat.—Indigenous to the Molucca Islands, cultivated in India, Sumatra, West Indies, and South America.

Collection.—The fruits are collected after they split, being detached from the branches by means of a pole or hook; the pericarp is then removed, after which the arillus is carefully detached from the nut-like seed. The nuts are then placed on frames and gently dried over a wood fire. This requires from six weeks to two months; during this time the nuts are frequently turned, at the end of this time the kernels rattle in the shell when shaken, they are then broken by means of a wooden mallet, assorted, and packed. For the Chinese market they are exported in the hard shells. In the Dutch East Indies the kernels are usually packed in milk of lime, when they are known as limed nutmegs, the object being to prevent germination. The vitality is best destroyed by exposing the kernels to the sun's heat for about a week.

Characters.—The nutmeg, when in the shell, is about an inch long, with a glossy, brown, woody and brittle testa, bearing the configurations of the mace or arillus; the raphe is of a light brown colour. The kernels or nutmegs of commerce are oval or roundish, varying in length, but generally about an inch, marked at the broad end by a scar which is connected by numerous furrows to a depression at the upper end. Externally, it is of a light greyish-brown colour, the furrows frequently containing a white powder (lime); internally, it is greyish-red, with darker reddish-brown markings, presenting a marbled appearance. This is caused by the enfolding endopleura, which penetrates into the perisperm in a very irregular manner. The embryo is situated at the broad end in a cavity of the perisperm; it is composed of a small radicle and two cup-shaped cotyledons. Odour agreeably fragrant and aromatic; taste oily, aromatic, and slightly acrid. Penang, Bencoolen, and Singapore nutmegs are unlimed.

Composition.—Nutmeg contains an agreeable volatile oil and a large quantity of fatty oil, with starch and proteinaceous matter.

The Essential Oil is obtained by distilling the nutmegs with water, or, better, with steam, and as much as 8 per cent. has been obtained from picked seeds. It is a pale yellow limpid liquid, having the warm, aromatic, and camphoraceous odour and taste of the seed.

The Fatty Oil is principally prepared in the East Indies by beating the nutmegs into a soft paste and then submitting them to pressure between hot plates, the yield being about 28 per cent. This oil is very incorrectly named *expressed oil of mace;* it is the *Oleum myristicæ expressum.* It is met with in blocks about a foot long, and wrapped in the leaves of a palm ; it is unctuous to touch, of an orange-brown mottled appearance, and melts at 130° F., and is soluble in two parts of warm ether.

Other Nutmegs.—There are other nutmegs met with occasionally, particularly the long nutmeg, derived from the Myristica fatua, of which the mace is inodorous, and the kernel of a paler colour.

Therapeutics.—Aromatic stomachic.

Official Preparations.—Ol. Myristicæ ; Ol. Myristicæ Expressum ; Pulv. Catechu Co. ; Pulv. Cretæ Aromaticus ; Sp. Armoraciæ Co. ; Tinct. Lavandulæ Co.

No. 165. Macis. *Mace.*

(Not official.)

The dried arillus of the fruit of Myristica fragrans.

Habitat.—The Molucca Islands.

Collection—Mace is the arillus of the nutmeg, and is attached to the base of the woody testa of the hilum and the raphe of which it is an expansion ; it is carefully removed from the shell, dried by exposure to the sun, when the brilliant scarlet colour changes to an orange yellow. It is frequently sprinkled with salt, with the object of preserving it.

Characters.—The entire arillus is about 1½ inch in length, smooth and compressed, thicker at the base, and longitudinally slit into narrow branching bands, slightly translucent and fatty. It has an agreeable aromatic odour and taste resembling nutmegs.

Composition.—Mace contains a volatile oil and a considerable quantity of a coloured resin, with a little sugar and a peculiar starch.

LAURACEÆ.

No. 166. Cinnamomi Cortex. *Cinnamon Bark.*

The dried inner bark of the shoots from the truncated stocks or stools of the cultivated cinnamon tree Cinnamomum Zeylanicum.

Habitat.—The cinnamon tree is a native of the island of Ceylon, but is also extensively cultivated.

Collection.—The tree is pruned so as to form stools from which a number of shoots are raised; these are allowed to grow for about two years, or long enough for the corky layer to turn brown. The shoots, which have now attained a length of six or eight feet, are cut off, and the thin portions and leaves removed, these forming the cinnamon chips. The bark is now cut obliquely, or in a straight line, to a distance of twelve or eighteen inches; it is then removed by inserting the end of the peculiar knife which is used for the purpose. The strips are now placed one within the other, made into bundles, and stored in a room for a day. The bundles are then withdrawn, undone, and each quill placed on a stick and carefully scraped to remove the outer layers. The small sticks are then placed within the larger ones, forming a rod of 3½ feet long; these are at first kept in the shade and finally dried in the sun. When thoroughly dry they are made up into bundles of 20 or 30 lbs. weight for exportation. Cinnamon is also produced in Java, Tellicherry, Brazil, and the West Indies, but of a quality inferior to the Ceylon cinnamon.

Characters.—Cinnamon bark occurs in closely rolled quills about 40 inches in length and about half an inch in diameter, composed of eight or ten layers of thin bark.

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The bark is very thin, brittle, splintery, and slightly pliable; it is of a dull, light yellowish-brown colour, externally smooth and marked with wavy lines, with a few scars left by branches or leaves. The inner surface is of a dark brown hue and slightly striate; odour, agreeable and aromatic; taste, aromatic, sweetish, and pungent.

Composition.—The bark contains a fragrant volatile oil, tannin, sugar, mannite, and starch. A decoction of cinnamon discharges the colour from a considerable amount of iodine.

The Essential Oil is almost entirely distilled in Ceylon from the chips and refuse bark by means of steam. It is a pale golden yellow liquid, becoming red or brownish-red with age, and on exposure to the air for some time it deposits crystals of cinnamic acid. The oil has a strong aromatic odour, and a hot, sweetish and aromatic taste; it is readily soluble in alcohol, and is neutral to test-paper when fresh, becoming acid on keeping.

Adulteration.—The common and cheaper substitute, cassia or Chinese cinnamon, has been offered for Ceylon cinnamon, but its inferiority is readily recognized. The powdered cinnamon is more frequently mixed with powdered cassia, and is easily detected by the decoction readily giving a blue colour with one or two drops of iodine solution.

Therapeutics.—Aromatic stomachic.

No. 167. Cortex Cassiæ Chinensis. *Chinese Cinnamon Bark.*

Synonym:—Cassia Bark. Cassia Lignea.

(Not Official.)

The dried inner bark of the shoots of Cinnamomum Cassia and other species of Cinnamomum.

Habitat.—Various species of cinnamon are found growing in the warm countries eastward of India, but the principal sources of cassia bark are the southern provinces of China, Tonquin, and Burmah.

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Collection.—In Southern China the trees are allowed to grow for 6 or 7 years before they are touched, the branches are then removed during the months of March, April, and May, by cutting close to the ground. The small twigs and leaves are removed, after which the bark is slit lengthwise and removed by inserting the edge of the knife. In this condition the bark is then laid out, and the outer layers removed by means of a small plane, after which it is allowed to dry, and then packed in bundles.

Characters.—Chinese cinnamon bark is met with in bundles or in loose broken quills, the quills varying from a quarter to one inch in diameter; the outer surface is of a reddish-brown colour, finely wrinkled, marked at intervals with leaf scars and small patches of the suberous layer; it breaks with a somewhat short fracture; the odour resembles that of cinnamon, but is not so aromatic, being harsher.

Composition.—The bark contains an essential oil which is obtained by steam distillation; chemically it is closely related to true cinnamon oil, but differs somewhat in its physical properties. A decoction of this bark, when cold, gives a blue colour with a drop of solution of iodine.

Cassia Buds.—These are the small unripe fruits of Cinnamomum cassia, and probably other species; they are principally exported from Canton. In appearance they closely resemble cloves, and consist of a thick perianth compressed over a small ovary. They have a cinnamon-like odour, a sweet aromatic taste, and contain an essential oil closely resembling that of the bark.

No. 168. Camphora. *Camphor.*

A stearoptene or concrete volatile oil obtained from the wood of Cinnamomum Camphora (Camphora officinarum), purified by sublimation.

Habitat.—It is found indigenous to Japan, Formosa, China, and Cochin China. The tree is cultivated in some districts of Italy.

Collection.—The following method, as described by Oishi, is employed in Japan, for its preparation:—The camphor-wood is chopped up into small pieces and placed in a wooden tub provided with a perforated bottom; this is fixed on to an iron boiler containing water, and the top of the tub is connected, by means of bamboo pipes, with a flat wooden condenser. The condenser is surrounded with another wooden vessel containing cold water. Over this is placed another trough of the same size, in which water is kept to cool the top of the vessel. The boiler being filled with water, firing is applied, and, as the steam rises, it carries the vapours of the camphor and oil with it over into the condenser, where it solidifies and is mixed with oil and water. The process is repeated for about a week, after which the condenser is removed, and the camphor and oil taken out. The camphor is now strained from the oil and packed in barrels for exportation. In some districts in China it is obtained by boiling the chips with water and removing the camphor as it rises to the surface. By this crude method a considerable loss is sustained.

Refining.—As imported, camphor requires to be sublimed to free it from dirt and other impurities. The process of sublimation is carried out in glass vessels known as *bombaloes*, which are large depressed glass globes with short necks. The camphor is reduced to powder and mixed with lime, sand, or charcoal, and packed at the bottom of these globes, and then placed on a sand-bath, at first rapidly heated to remove water, and then heated to about 400° F., and the temperature carefully regulated so that it condenses in solid masses. In America the camphor is distilled into a large chamber in which it condenses as a crystalline powder; this is afterwards submitted to powerful hydraulic pressure, and is compressed into solid cakes or blocks.

Characters.—Refined camphor is in solid, colourless, crystalline, translucent, circular masses, traversed by numerous fissures when of any size; it is tough and not pulverizable unless previously moistened with alcohol, ether, or chloroform. It readily evaporates at ordinary temperatures, condensing in fine prisms or plates on the top of the vessel; it has a powerful penetrating odour, and

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an aromatic, pungent taste, followed by a sensation of cold. It floats on the surface of water, in which it is sparingly soluble, burns with a smoky flame, and is readily soluble in alcohol, chloroform, ether, and volatile oils.

Allied camphor :—

Borneo Camphor, is obtained from the Dryobalanops Camphora (D. aromatica). (*Nat. Ord. Dipterocarpeæ*). It is less volatile than laurinol or ordinary camphor, and harder; when placed in water it sinks. Odour somewhat different from ordinary camphor.

Adulteration.—As the Chinese export the whole of the camphor they prepare, and only use the Borneo variety, they have quite recently been sophisticating their camphor by mixing it with a transparent glue. The fraud is quite easily detected, and at a recent sale at Tamsui a considerable amount was rejected on this account.

Therapeutics.—Stimulant.

No. 169. Sassafras Radix. *Sassafras Root.*

The dried root, reduced to chips or shavings, of Sassafras officinalis.

Habitat.—Indigenous to North America; in the Southern States it is a tall tree about 50 feet in height.

Characters.—As imported it is in large branched pieces with portions of the stem attached; frequently the bark is detached, it varies in size and colour from reddish-brown to yellowish-white. The bark, if detached, is in curved pieces more or less flat, of a rusty brown colour, finely striate on the inner surface, soft and fragile. The wood is spongy, of a dull reddish-brown, porous and light, and composed of numerous annulated layers. Odour of the root fragrant and agreeable; taste aromatic, sweetish, and astringent.

Composition. — Sassafras root contains a volatile oil, sassafrid, tannin, starch, and resin.

Substitutes.—Fabæ Puchury, Puchury beans, Sassafras nuts. The dried cotyledons of Nectandra Puchury major, and N. Puchury minor, plants indigenous to Brazil. They consist of the single cotyledons of the embryo. They are concavo-convex, blackish-brown in colour, from 1 to 2 inches in length, and frequently covered with the wrinkled testa. They have an aromatic taste and odour somewhat resembling sassafras. They contain an essential oil, and about one-fifth their weight of a solid fat, and are principally used for flavouring.

Therapeutics.—Stimulant and diaphoretic.

Official Preparation.—Decoctum Sarsæ Compositum.

No 170. Nectandræ Cortex. *Bebeeru Bark.* (*Greenheart Bark*)

The dried bark of Nectandra Rodiæi.

Habitat.—A tall tree growing throughout the higher districts of British Guiana.

Characters.—Greenheart bark occurs in flattish, heavy pieces, about two feet in length and six inches broad, and a quarter of an inch or more thick, and consists of the liber bark only. It is hard and brittle, the outer surface is of a light greyish brown, and marked with numerous depressions, the ridges mainly consisting of soft cork. The inner surface is a dark cinnamon brown and roughly striate; it is inodorous; taste bitter and astringent; and breaks with a short granular fracture.

Composition.—The bark contains several alkaloids, viz. :—beberine, nectandrine, and sipirine, with a little tannin. The alkaloids exist in combination with beberic acid.

Therapeutics.—Astringent tonic.

Official Preparation.—Beberinæ Sulphas.

No. 170a. Lauri Fructus. *Bay Berries.*

The ripe fruit of Laurus nobilis.

Habitat.—Indigenous to the Levant.

Characters.—Bay berries are sub-globular oval drupes of a greenish-black colour, fragile, and slightly wrinkled. Each berry contains one seed, which has a peculiar odour and taste.

Composition.—The fruits contain about 20 per cent. of a fatty oil, and 2 per cent. of volatile oil with a little resin.

ARISTOLOCHIACEÆ.

No. 171. Serpentariæ Rhizoma. *Serpentary Rhizome.*

Synonym :—Serpentariæ Radix.

The dried rhizome and rootlets of Aristolochia serpentaria or Aristolochia reticulata.

Habitat.—Indigenous to the United States.

Characters.—Virginia Snakeroot consists of a twisted rhizome about an inch long and an eighth of an inch thick. It is knotty and bent in an undulating manner, bearing on its upper surface the remains of the short stems of previous growth; on the under surface numerous thin, long rootlets are matted together; colour, dull yellowish-brown; odour, camphoraceous and aromatic; taste warm, aromatic, camphoraceous, and slightly bitter. The branching rootlets have a thick cortical layer containing numerous oil cells.

Composition.—The drug contains a bitter principle serpentarin, and an essential oil, besides tannin, sugar, and a resin.

Therapeutics.—Aromatic stimulant.

Official Preparations.—Inf. Serpentariæ; Tinct. Cinchonæ Co.; Tinct. Serpentariæ.

THYMELACEÆ.

No. 172. Mezerei Cortex. *Mezereon Bark.*

The dried bark of Daphne Mezereum or of Daphne Laureola.

Euphorbiaceæ.

Habitat.—Indigenous to Europe. Daphne Laureola is also found in Asia Minor.

Characters.—Mezereon bark, which is usually collected during the winter, is in long, thin, more or less flattened strips, which are folded with the outer surface inwards, or rolled into flattish discs ; occasionally it is in quills a foot or more in length. The thin bark varies in colour externally from reddish-brown to pale yellow or yellowish-brown, with a coppery hue, and marked with numerous black warts or leaf scars ; internally silky or white, the hairy appearance being due to loose bast fibres. The root bark is of a slate colour, and does not possess leaf scars. When fresh it has a disagreeable odour, but becomes inodorous on drying ; when chewed it has a burning and acrid taste. Moistened with water and applied to the skin it produces vesication.

Composition. — Mezereon bark contains a glucoside daphnin and characteristic fatty resin which is more or less volatile.

Therapeutics.—Rubefacient. The ointment is employed for keeping blisters open.

Official Preparations.—Dec. Sarsæ Co. ; Ext. Mezerei Ethereum.

EUPHORBIACEÆ.

No. 173. Cascarillæ Cortex. *Cascarilla Bark.*

The dried bark of Croton Eluteria.

Habitat.—A native of the Bahama Islands. The bark is chiefly exported from the port of Nassau, Bahamas.

Characters.—Cascarilla bark is in quills or channelled pieces, two or three inches in length, and about half an inch or less in diameter. Externally it is covered with a thin greyish-brown easily detached suberous layer, which is marked with a silvery lichen with black dots. In the older pieces it is transversely fissured and more rugose ; the inner surface is smooth and brownish-grey ; fracture short, resinous, the broken surface exhibiting numerous oil and resin cells. Odour fragrant and aromatic, particularly when burned; taste aromatic, warm, and bitter.

Composition.—The bark contains a volatile oil, a bitter principle, and a resin, with a little tannin, wax, and starch.

Therapeutics.—Aromatic tonic.

Official Preparations.—Inf. Cascarillæ; Tinct. Cascarillæ.

No. 174. Tiglii Semen. *Croton Seed.*

The ripe seeds of Croton Tiglium (Tiglium officinale).

Habitat.—Indigenous to India and the Philippine Islands. Cultivated in many East India Islands and in Japan.

Characters.—Croton seeds are about half an inch long and nearly the same in breadth, oblong or ovoid, flattened on the ventral side, divided longitudinally into two unequal halves, along the surface runs the light-coloured raphe from the hilum, terminating in a black point, the chalaza. Externally the seeds are marked with a light brown coating, underneath which may be seen the thin, black, and brittle testa enclosing an oily kernel, covered with the thin endopleura. The oily perisperm contains the thin foliaceous cotyledons and radicle. The seed is inodorous; taste oily at first, afterwards acrid. The fruit is a trilocular schizocarp containing three seeds.

Composition.—Croton seeds contain from 40 to 60 per cent. of a fatty vesicating oil, which is the principal constituent.

The Fatty Oil is prepared in India, England, and America, that prepared in England being the best. It is obtained by submitting the kernels, after removal of the testa, to pressure between rollers; occasionally slight heat is applied. In America the seeds are crushed, then packed in bags and dipped in boiling water; the oil as it rises to the surface is skimmed off. English croton oil is of a deep reddish-brown or sherry colour, the Indian oil being a pale yellow. It is slightly fluorescent, viscid, and has a faint peculiar rancid odour, with an acrid, burning taste. It is freely soluble in chloroform and ether, and in an equal volume of alcohol, ·800, but on a further addition a separation takes place (Senier). It is slightly acid to test-paper, and becomes more viscid on exposure to the air, depositing fatty acids.

Therapeutics.—A drastic purgative.

Official Preparation of the Oil.—Lin. Crotonis.

No. 175. Ricini Semen. *Castor Oil Seed.*

The ripe seed of Ricinus communis.

Habitat.—A native of Southern Asia, cultivated in Egypt, Italy, and largely in the United States.

Characters.—The fruit resembles that of the croton plant, and contains three seeds. These seeds vary in size, the largest being an inch in length, broad, flattened on the ventral side, smooth; the shining grey-coloured epidermis is variegated with numerous brown, yellow, or reddish-brown spots and lines. The flat ventral side is marked by a prominent raphe running from the large tumid caruncle situated near one end; on removing the caruncle or strophiole, it leaves a black scar just above the hilum. The testa is hard and brittle; the endopleura white and thin, with a brown coloured chalaza; it encloses the white oily perisperm, which contains the cordate cotyledons and short cylindrical radicle. When the kernel is chewed it has a bland oily taste, very faintly acrid.

Composition.—The seeds contain a peculiar product analogous to emulsin, a fatty oil, and a substance called ricinine.

The Fatty Oil is the principal and most important constituent of the seeds, and exists to the extent of 50 per cent.

Preparation.—The seeds are first freed from their integuments by gently crushing and then winnowing, after which they are submitted to powerful pressure in hydraulic presses. By cold pressure they yield about 30 per cent., when heat is used they yield as much as 45 per cent. of a

Euphorbiaceæ.

darker oil. It is frequently submitted to treatment with a mixture of recently calcined magnesia and purified animal charcoal, after which it is filtered; by this treatment it becomes nearly inodorous and colourless. Castor oil is a viscid colourless or pale straw yellow liquid, with scarcely any odour, and a mild, faintly acrid, and unpleasant taste. It is entirely soluble in an equal volume of glacial acetic acid, absolute alcohol or ether, it is neutral to test-paper, but on exposure becomes faintly acid, and dries up after a time to a transparent varnish.

Therapeutics.—A mild cathartic.

No. 176. Kamala. *Kamala.*

A powder which consists of the minute glands and hairs obtained from the surface of the fruits of Mallotus Philippinesis (Rottlera tinctoria).

Habitat.—Kamala grows throughout India, Arabia, Ceylon, Eastern China, Australia, and Eastern Africa.

Collection.—The capsular fruits are collected and placed in baskets standing on a coarse cloth. The fruits are then well rubbed with the hands to divest them of the hairs and glands, after which the baskets are vigorously shaken, when the powder falls through on to the cloth. The powder is principally shipped from Kurrachee and Bombay.

Characters.—Kamala is a fine granular powder of a brick-red or madder colour, resinous in appearance, and is tasteless and inodorous. Water has little or no effect upon it even when boiling, but macerated in alcohol it forms a deep red solution; alkalies, chloroform, and ether form similar solutions. Microscopically examined the glands are seen to consist of a thin membrane containing numerous yellow-coloured masses of club-shaped vesicles containing a red substance; the hairs are simple, thick, and stellate.

Composition.—Kamala contains about 80 per cent. of resin and a little tannin.

Adulteration.—Of late years kamala has been systematically adulterated, sometimes with red bole or powdered red brick, and occasionally with the dried and powdered flowers of Carthamus tinctorius.

Uses.—In India and this country it is principally used for dyeing silk an orange brown.

Therapeutics.—A powerful anthelmintic.

No. 177. Euphorbium. *Euphorbium.*

(Not official.)

A gum resin obtained from the stem of Euphorbia resinifera.

Habitat.—The plant is a native of Morocco, growing on the lower slopes of the Atlas Mountains.

Collection.—The gum-resin is obtained by incising the stems or fleshy branches, when it exudes as a milky juice, which quickly hardens on exposure, generally incrusting the spines. It is collected towards the end of summer, the mouths and nostrils of the collectors being covered with a cloth to keep out the intensely irritating dust.

Characters.—Gum euphorbium is in small irregular pieces, about half an inch in diameter, usually with two or three small holes, caused by the spines of the plant. It is of a brownish-yellow colour, with a glossy, waxy appearance; brittle and translucent; inodorous, but when crushed the powder produces prolonged and violent sneezing. Taste, strongly acrid and burning, and when triturated with water it yields a white emulsion.

Composition.—Euphorbium contains a peculiar body euphorbon, a resin, gum, and malic acid in combination with sodium and calcium.

Gum euphorbium contains from 20 to 25 per cent. of euphorbon, and from 35 to 48 per cent. of resin.

Commerce.—It is now largely shipped from Mogadore, and is used in coating metal and other work used in marine architecture.

No. 177a. Euphorbia Piluliferæ.

The entire plant.

Habitat.—Australia.

PIPERACEÆ.

No. 178. Piper Nigrum. *Black Pepper.*

The dried unripe fruits of Piper nigrum.

Habitat.—Indigenous to India; introduced and largely cultivated in Java, Borneo, Sumatra, the Philippine and West Indian Islands.

Collection.—The Pepper Vine grows to a height of 30 feet, and is carefully trained by the natives; it bears numerous spikes of monœcious or diœcious flowers. As soon as the spikes of fruits commence to turn from green to red or reddish-brown they are removed; the next day the berries are removed by rubbing with the hands; they are then dried either by exposure to the sun, or placed in baskets, which are hung over a gentle fire.

Characters.—Black pepper berries are globular, and about one fifth of an inch in diameter; the pericarp is deeply wrinkled, and reticulated, thin, and blackish-brown or greyish-black in colour, containing a hard, smooth, globular seed of a light yellowish-brown colour. Odour, aromatic; taste, pungent, hot, and bitterish.

Composition.—Pepper contains an alkaloid, a volatile oil, and an acrid resin, besides starch and gum.

Adulterations.—(*a*) Whole Pepper is frequently mixed with the stalks which supported the fruit, and artificial peppercorns have been found to the extent of 20 per cent. They are made from pepper dust, oilcake, clay, and cayenne pepper (Chevallier).

(*b*) Ground Pepper is frequently adulterated with linseed meal, mustard husks, ground rice, sand, pepper leaves, rape seed, and chicory, etc. A careful examination with the microscope is the best means of detection, coupled with the percentage of ash.

Other Peppers.—Piper album, White Pepper, consists of the ripe fruit of the Piper nigrum, which has been immersed in water and afterwards divested of its pericarp by rubbing. It consists of the seed covered by the thin white inner covering of the fruit.

White pepper is rather larger than the black, and not quite so pungent. It is principally imported from Tellicherry in Malabar.

178a. Piper longum consists of the dried spikes of Chavica officinarum and Chavica Roxburghii. The former is a native of Java and Sumatra, the latter of India and Ceylon and the Philippines. They are the full grown but still immature fruits, and agree in odour, taste, and composition with black pepper.

Therapeutics.—A stimulant stomachic.

Official Preparations.—Conf. Opii; Conf. Piperis; Pulv. Opii Co.

No. 179. Cubebæ. *Cubebs.*

The dried unripe full-grown fruit of Piper Cubeba (Cubeba officinalis).

Habitat.—Indigenous to Sumatra and Java.

Collection.—The plant is cultivated chiefly on coffee plantations, where advantage is taken of its large bushy size as a shade for the more tender coffee shoots. When the spikes have acquired their full size, they are carefully removed, dried by exposure to the sun, and the fruit is removed with the small stalk still adhering to it.

Characters.—Cubebs are globular and of the size and appearance of black pepper, tapering at the base into a rounded stalk, which is continuous with, and permanently attached to, the pericarp; the apex is somewhat pointed from the remains of adherent stigmas. After removing the epicarp, a hard brown endocarp is found, forming a shell which encloses the seed in the mature fruit; as met with in commerce, many of the fruits have a shrunken seed. The fruit has a warm and aromatic odour, increased on crushing the fruit; taste, aromatic and pungent, slightly bitter.

Composition.—Cubebs contain a crystalline substance cubebin, a resin, cubebic acid, a volatile oil, gum, and a fixed oil.

Therapeutics.—Cubebs are principally used for their influence on the mucous membrane of the urethra and bladder.

Official Preparations.—Oleo-resina Cubebæ; Ol. Cubebæ; and Tinct. Cubebæ.

No. 180. **Maticæ Folia.** *Matico Leaves.*

The dried leaves of Piper angustifolium (Artanthe elongata, Piper elongatum).

Habitat.—Indigenous to the forests of Tropical South America.

Characters.—As found in commerce matico is frequently mixed with the fruits and flowers. The leaves are from 3 to 8 inches in length, oblong lanceolate, tapering towards the apex, cordate and unequal at the base; the margin is entire or finely crenulate; the petiole very short. The leaves are thick, with sunken veins; the upper surface uneven or tesselated, and of a faded green colour; the under surface downy with prominent veins. As generally seen, the leaves are compressed into a brittle mass, which, on breaking, has a somewhat aromatic odour; taste aromatic and bitterish. The flower spikes are about 4 inches in length, with the flowers crowded together, the stalk thin and cylindrical. The fruit small and black.

Composition.—Matico contains a crystalline acid, resin, volatile oil, and a little tannin.

Therapeutics.—Styptic.

Official Preparation.—Infusum Maticæ.

SALICACEÆ.

No. 181. Salicis Cortex. *Willow Bark.*

The dried bark of Salix alba and other species, viz. S. Caprea, S. Russelliana, and S. fragilis.

Habitat.—Indigenous to Europe.

Characters.—Willow bark occurs in quills or fragments of quills; externally it is smooth and covered with a thin corky layer, which in young bark is shiny, but in old pieces is covered with numerous round corky warts. It varies in colour from brown to grey; the inner surface is smooth and of a pale cinnamon-brown colour. It breaks with difficulty, but may be torn in shreds longitudinally; it has a slightly bitter and astringent taste, and is, when dry, inodorous. The bark is best collected in the spring, when it is more easily removed from the wood.

Composition.—Willow bark contains salicin, tannin, gum, and wax.

Official Preparation.—Salicin.

ULMACEÆ.

No. 182. Ulmi Cortex. *Elm Bark.*

(Not official.)

The dried inner or liber bark of Ulmus campestris.

Habitat.—Indigenous to Europe.

Characters.—Elm bark is generally collected in spring, and then freed from the rough external suberous layer, after which it is dried. The inner bark is found in pieces of various sizes, flat, and of a rusty-brown colour externally; the inner surface smooth, of a pale-brown colour, and finely striate. It is tough and fibrous, and breaks with difficulty; it is inodorous, with a feebly astringent and mucilaginous taste.

Composition.—Elm bark contains a considerable amount of mucilage and traces of tannin. The spontaneously exuded gum found on the tree, and which darkens on exposure to the air, is incorrectly called ulmin. The bark also contains small quantities of a bitter principle; the tannin gives a dark-brown precipitate with ferric chloride.

No 182a. Slippery Elm.

The dried bark of the Ulmus fulva, a tree indigenous to the United States. This bark is generally in long strips about three inches broad and two or three feet in length; it principally differs from elm bark in having a peculiar fœnugreek-like odour. - It contains a large quantity of mucilage.

ARTOCARPACEÆ.

No. 183. Ficus. *Fig.*

Synonym:—Fructus Caricæ.

The dried fruit of Ficus Carica.

Habitat.—Indigenous to Asia Minor; it is also cultivated in the warmer districts of Europe and America.

Characters.—The fig consists of the thick, succulent, hollow receptacle, which is pear-shaped and erroneously called a fruit; it bears on its inner surface numerous seed-like achenes. The receptacle is marked at its apex by a round orifice, which is usually surrounded by a few scales; when unripe it is green, and contains an acrid juice, which has a sweet taste on ripening. Figs have a fruity odour and sweet agreeable mucilaginous taste. The large pulpy figs, which are the best, are known as Smyrna or Turkish figs; the small figs, of inferior quality, which are often strung on cord, are known as Greek figs.

Composition.—Figs principally contain grape sugar, which not unfrequently amounts to 70 per cent. by weight of the fruit; they also contain gum and about 16 per cent. of moisture.

Official Preparation.—Confectio Sennæ.

MORACEÆ.

No. 184. Mori Fructus. *Mulberries.*

The ripe fruit of Morus nigra.

Habitat.—It is indigenous to Asia Minor, and is cultivated throughout Europe.

Characters.—The mulberry tree bears unisexual catkins, the female catkin is ovoid in form, and through the coalescence of the overlapping calyces, the fruits as they ripen resemble a compound berry (sorosis) about an inch in length, oblong, and of a purple colour, having an agreeable subacid taste. When pressed they yield a dark violet or purple juice, which is almost inodorous.

Composition.—Mulberries vary in composition according to their age. The juice yielded to Wright and Patterson, glucose, citric, and malic acids.

Official Preparations.—Succus Mori and Syrupus Mori.

CUPULIFERÆ.

No. 185. Quercus Cortex. *Oak Bark.*

The dried bark of the smaller branches and young stems of Quercus Robur and Quercus pedunculata.

Habitat.—Indigenous to Great Britain.

Characters.—The bark is collected in spring, and varies in its appearance according to age. As usually met with, it is in channelled pieces or quills, from a few inches to two feet in length, and about one-tenth of an inch thick. The external surface is smooth, shiny, grey or greyish-brown in colour, and marked with scars; the inner surface is rusty brown in colour, and ridged, the fracture fibrous and tough. It has a feeble odour, and an astringent taste.

Composition.—Oak bark contains a characteristic tannin, a terpene resin, and phlobaphen.

Therapeutics.—Astringent.

Cupuliferæ.

Official Preparation.—Decoctum Quercus.

No. 186. Galla. *Galls.*

Synonym :—Nut Galls.

Excrescences on Quercus lusitanica, *var.* infectoria, caused by the puncture and deposit of an egg or eggs of Cynips gallæ-tinctoriæ.

Habitat.—Q. Lusitanica is a shrubby plant indigenous to Asia Minor, Greece, and several of the islands in the Mediterranean.

Formation.—Galls are produced on numerous plants, but different varieties of oak seem to be more liable to the visits of these insects than many other trees. The female insect pierces the young bark with its ovipositor, and then deposits one or more eggs in the wound ; the local irritation produced by this operation causes the formation of an excrescence which encloses the larvæ, which ultimately hatch within the gall.

Characters.—Galls are hard, heavy, and subglobular, from half an inch to three quarters of an inch in diameter, more or less tuberculated on the surface. They are a deep olive-green or bluish-green colour externally, and brown or greyish-brown internally ; the fractured surface has a resinous lustre. Galls are inodorous ; taste, strongly astringent, afterwards sweetish. In commerce Aleppo galls are considered the best.

Composition.—Galls contain gallic and gallotannic acids, resin, and sugar.

Gallotannic Acid is contained in the best oak galls to the extent of 70 per cent.

Gallic Acid exists naturally in galls to the extent of about 3 per cent. It differs from tannic acid in not precipitating gelatine solution.

Official Preparations.—Acid. Gallicum ; Acid. Tannicum ; Tinct. Gallæ ; Ung. Gallæ ; and Ung. Gallæ cum Opio.

Allied Galls.—Chinese and Japanese galls are produced on the leaves and leaf stalks of Rhus semialata by the insect Aphis Chinensis. They are very irregular in form, thin, and appear as if stalked; towards the middle and apex a few protuberances occur. The shells are covered with a fine down, and when broken numerous remains of dead insects are found. They contain from 70 to 80 per cent. of tannin.

English Galls, obtained from the Quercus Robur, are small and of a pale colour, and rarely contain more than 12 per cent. of tannin.

SANTALACEÆ.

No. 187. Santali Lignum. *Sandal Wood.*

The heart-wood of Santalum album and probably other species.

Habitat.—The white sandal-wood tree and other members of this genus are found distributed amongst the East Indian Islands, Tropical Asia and Australia.

Collection.—The tree is carefully protected by the Government in the forests of Mysore, where it is principally produced, and only those trees which have arrived at maturity are allowed to be felled. The tree having been felled—this taking place usually at the end of the year—it is freed from its branches and bark, and either allowed to lie on the ground for some time, in which case the white ants destroy nearly all the inodorous alburnum, or this portion of the stem is removed by means of an axe. The trunk is then cut into billets of different lengths. The roots are also dug up, trimmed, and yield a valuable wood; it is also largely used for the preparation of the oil.

Characters.—As met with in commerce, white sandal wood occurs in billets nearly four feet in length, and from 6 to 10 inches in diameter. It is hard and heavy, colour varying from a pale yellow to a light reddish-brown; taste aromatic; odour, agreeable and persistent, increased on powdering or warming the wood. The billets split somewhat easily, the concentric zones are darker towards the inside and porous. Examined under the microscope numerous oil and resin cells are visible.

Composition.—The duramen alone yields the essential oil; it is not contained in the younger alburnum, or bark. Besides the essential oil, the wood contains a resin and tannic acid, the latter giving a green colour with neutral ferric chloride.

No. 188. Oleum Santali. *Oil of Sandal Wood.*

The oil is distilled from the wood of Santalum album. It is distilled in some quantity in Mysore, but the bulk is principally distilled in Germany. It is occasionally distilled in this country.

Characters.—Sandal wood oil is thick in consistence, of a pale yellow colour, possessing in a marked degree the aromatic odour and pungent taste of the wood. Its specific gravity varies somewhat; according to W. H. Ince ·9797 to ·9650 is the limit between which the true oil varies. The oil is neutral, or only faintly acid in reaction, readily soluble in alcohol in all proportions, and in an equal volume of alcohol sp. gr. ·920; when old its solubility is somewhat lessened, and it is darker in colour.

Adulterations.—Sandal wood oil is frequently the subject of sophistication; fixed oils, and oils of cedar wood or copaiba are those most frequently met with, whilst a sample lately examined contained a notable quantity of alcohol.

HAMAMELIDEÆ (Liquidambaraceæ).

No. 189. Styrax Præparatus. *Prepared Storax.*

A balsam prepared from the inner bark of Liquidambar orientalis, and purified by solution in spirit, filtration, and evaporation.

Habitat.—Indigenous to south-western Asia Minor.

Hamamelideæ.

Production.—The outer bark is first removed from the tree, and is generally reserved for use in the preparation of incense; the inner bark is then carefully scraped off by means of a blunt instrument, and is then removed and placed in pits until a considerable quantity has been obtained. The scrapings are either submitted to pressure and then treated with hot water (Maltass), or they are boiled with water, and the resin, as it rises to the surface, is skimmed off, the residue being squeezed in a wooden press, and the semifluid resin usually collected in barrels.

Purification.—Storax is purified by melting it with rectified spirit, straining the solution, and then recovering the spirit; according to Biel nearly 70 per cent. is lost in this way, so that he prefers dissolving the balsam in warm benzol, filtering, and recovering the benzol; by this method 90 per cent. is obtained.

Characters.—Liquid storax is a semi-transparent, or, in thin layers, transparent brownish-yellow viscid balsam, of the consistency of honey. When heated it becomes more liquid, and from the crude drug small globules of water will separate; when ignited it burns with a bright flame. It has an agreeable odour and balsamic taste; it is soluble in carbon bisulphide, ether, and alcohol, the last solution forming a deposit after a time; it yields to hot petroleum ether about 5 per cent. of its weight, the solution when cool depositing crystals. When boiled with bichromate or permanganate of potassium and sulphuric acid it evolves an odour resembling essential oil of bitter almonds.

Composition.—Storax contains amongst other bodies storesin, cinnamic acid, styrol, styracin, and styrogenin.

Adulteration.—Storax is sometimes mixed with earth, pieces of bark, and sand. Purified storax has been found adulterated with turpentine; this is readily detected by agitating with petroleum ether; on the evaporation of the ether the residue should have an agreeable balsamic odour; turpentine, if present, will leave a yellow-coloured residue with the pronounced odour of turpentine.

Official Preparation.—Tinctura Benzoini Composita.

CANNABINACEÆ.

No. 190. Cannabis Indica. *Indian Hemp.*

The dried flowering and fruiting tops of the female plants of Cannabis sativa, grown in India, and from which the resin has not been removed.

Habitat.—Indigenous to Central and Western Asia. As a drug it is principally produced in the districts of Bogra and Rajshahi, north of Calcutta, where it is largely cultivated.

Characters.—Indian hemp, as prepared in India, is met with in two forms, viz., Gunjah, Ganja, or Guaza, and Bhang. The former is that which the British Pharmacopœia recognizes.

Gunjah or *Ganja* consists of the flowering shoots of the female plant, 4 to 8 inches in length, more or less compressed together in masses, of a greenish-brown colour, with a few small leaves, and the remains of a large number of flowers, and a few nearly ripe fruits. It is brittle, with a slightly bitter taste, and a heavy peculiar narcotic odour.

Bhang.—This consists chiefly of the dried and broken leaves in the form of a coarse powder. It is of a dark-green colour; odour narcotic and disagreeable. It is principally smoked with or without tobacco, and is also used in preparing confections and beverages.

Charas or *Churrus* consists of the resin which exudes, and is collected by rubbing the matured tops in the hands and scraping off the adhering resin from the fingers. Other methods are also resorted to for the removal of the resin. Charas is a dark brown, firm or sometimes friable mass of varying size. It is rarely if ever found in European commerce, being principally used by the natives.

Composition.—Much doubt exists as to what is the active principle of Indian hemp. It contains a volatile oil, resin, and a volatile alkaloid.

Official Preparations.—Ext. Cannabis Indicæ; Tinct. Cannabis Indicæ.

Cannabinaceæ.

No. 191. Lupulus. *Hop.*

Synonym :—Strobili Humuli.

The dried strobiles of Humulus Lupulus, from plants cultivated in England.

Habitat.—The Hop is indigenous to Europe, and has been introduced into North America, Australia, and Brazil.

Characters.—Hop strobiles, as found in commerce, are more or less compressed. When unbroken they are a little over an inch in length, ovate or rounded in form, and consist of numerous thin greenish-yellow or brownish-yellow, membranous, enlarged stipules and bracts, attached to a hairy, irregular glandular axis. These leafy bodies are nearly ovate, glandular at the base, and surround a small achene, having numerous brownish-yellow glands on its surface. Odour, when fresh, agreeably aromatic, but when kept for some time it becomes unpleasant; taste bitter, slightly astringent, and aromatic. After drying, hops are frequently subjected to the vapour of sulphurous acid gas.

Composition.—Independent of the constituents contained in the glands, hop contains tannin, resin, volatile oil, and an alkaloid.

Official Preparations.—Ext. Lupuli; Inf. Lupuli; and Tinct. Lupuli.

No. 192. Lupulinum. *Lupulin.*

A glandular powder obtained from the dried strobiles of Humulus Lupulus.

Collection.—Lupulin is usually collected by removing the bracts, then rubbing and shaking them in wicker baskets, after which the powder is separated from coarser particles by means of a sieve. The dried strobiles afford 8 to 12 per cent. of lupulin. Lupulin ought to be washed by decantation to remove sand, and then dried.

Coniferæ.

Characters.—It consists of numerous globular or ovoid-shaped, reticulated, translucent glands, forming a bright yellow granular powder. When fresh, the glands contain a brownish-yellow liquid which by age becomes a brown resinous mass. Lupulin burns readily, and has the pleasant aromatic odour and taste of the hop ; on incineration it should not leave more than 10 per cent. of ash. When exhausted with ether, the insoluble residue should not exceed 30 per cent. by weight, and the ethereal extract should possess the odour of the hop in a marked degree.

Composition.—Lupulin contains an essential oil, identical with that of the hop, a bitter principle, wax, and resin.

Adulteration.—Lupulin is frequently mixed with sand, and some samples consist solely of the sweepings of the storage rooms. Such extraneous matter is easily detected by incineration.

CONIFERÆ.

No. 193. Oleum Terebinthinæ. *Oil of Turpentine.*

The oil distilled, usually by the aid of steam, from the oleo-resin (turpentine), obtained from Pinus australis (Pinus palustris), Pinus Tæda, and sometimes Pinus Pinaster and Pinus sylvestris ; rectified if necessary.

Habitat.—Pinus australis and P. Tæda are large trees, forming, with other members of this genus, huge forests throughout North America, and produce American turpentine.

Pinus Pinaster, *P. sylvestris* and *P. laricis* are indigenous to Europe, and afford European turpentine.

Secretion.—The resin ducts containing the turpentine are found in the bark and wood of the trees ; in some species they reside almost solely in the bark, and in others chiefly in the wood, consequently different methods are resorted to in the collection of the turpentine.

Production.—In North Carolina the operator usually cuts a large hole near the base of the trunk, technically known

Coniferæ.

as a *turpentine box.* These holes vary in shape and capacity, some holding nearly a quart; the box being completed, the bark and a thin layer of the wood are cut or hacked, and from this wound the oleo-resin exudes, and collects in the box; the hacking is repeated from time to time above the old wounds, until they reach a height of about 20 feet. After this the other side of the tree is tapped in the same way and the process repeated. The turpentine or dip is collected and conveyed to the distilleries, where it is poured into large copper stills, and heat applied. The distillate is removed, and the oil separated from the water and transferred to barrels, in which it enters commerce. The residue is run out from the still and constitutes resin.

Purification.—As oil of turpentine of commerce is frequently impure, it is rectified by redistillation from water, or preferably from slaked lime, the residue from this operation being used in soap manufacture.

Composition.—Oil of turpentine consists of a neutral hydrocarbon terebinthine.

Adulteration.—Oil of turpentine is sometimes adulterated with Russian turpentine or rosin oil. As both these products are complex mixtures of bodies closely related to terebinthinene, but differ in their odour, sp. gr., and boiling point, a careful examination of the character of true turpentine is the best means of detection.

Allied products.—Russian oil of turpentine. This oil is obtained by distilling the roots of different species of Pinus, particularly Pinus sylvestris and P. Ledebourii. The oil so obtained contains the products of the destructive distillation of the wood as well as the resin. Its chief characters consist in the great absence of uniformity of sp. gr., boiling point, and optical power.

Official Preparations.—Conf. Terebinthinæ; Enema Terebinthinæ; Lin. Terebinthinæ; Lin. Terebinthinæ Aceticum; and Ung. Terebinthinæ.

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No. 194. Resina. *Resin.*

Synonyms:—Rosin.—Colophony.

The residue left after the distillation of the volatile oil of turpentine.

Characters.—Resin is of different degrees of colour. This is partly due to the age of the oleo-resin. The first flow yields a residue of a pale yellow colour, and as age increases it changes to a yellowish-brown, and finally brown. When the oil has been distilled at high temperature, the residue constitutes black resin. White or amber resin is a translucent yellowish brittle mass, easily pulverizable; having a shiny fracture; terebinthinate odour and taste. It is soluble in glacial acetic acid, strong alcohol, ether, and alkalies, and melts at about 212° F. Yellow resin is opaque from the presence of water.

Composition.—Resin consists almost entirely of the anhydride of abietic acid.

Resin, when destructively distilled, yields resin oil, which contains numerous hydrocarbons, fatty acids, and colophene. It is largely used in the arts in preparing varnishes and paints.

Official Preparations.—Charta Epispastica; Emp. Calefaciens; E. Cantharidis; E. Picis; E. Plumbi Iodidi; E. Resinæ; E. Saponis; Ung. Resinæ; and U. Terebinthinæ.

No. 195. Thus Americanum. *Common Frankincense.*

The concrete turpentine which is scraped off the trunks of Pinus australis and Pinus Tæda.

Habitat.—North America.

Characters.—This turpentine is met with in two conditions: semi-fluid and solid. Semi-fluid turpentine is a viscid, honey-like liquid, opaque, and of a light yellow colour. On exposure to the air it becomes transparent; on keeping it separates, the crystalline deposit being abietic acid.

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Solid Turpentine, or Frankincense, is a soft, yellow, semi-opaque substance, with the odour and taste of turpentine; it consists of the turpentine which has naturally dried on the tree. By keeping it becomes dry and brittle, darker in colour, and milder in odour. Galipot or Barras is the corresponding product obtained in France from Pinus maritima.

Composition.—Frankincense consists principally of abietic acid, with varying proportions of volatile oil, and Galipot consists of Pimaric acid.

Official Preparation.—Emplastrum Picis.

No. 196. Oleum Pini Sylvestris. *Fir-wool Oil.*

The oil distilled from the fresh leaves of Pinus sylvestris.

Habitat.—The Pinus Sylvestris is found growing in Scotland, Finland, Russia, and Germany.

Preparation.—The leaves and young twigs are collected and distilled by steam, the light oil is separated from the distillate and filtered.

Characters.—Fir-wool oil is colourless, of a faint straw-yellow colour; neutral in reaction when fresh, but becomes darker in colour and acid on keeping. It has an aromatic, fragrant odour; taste, pungent and unpleasant. It requires seven times its volume of rectified spirit for complete solution; the specific gravity should not be below ·870.

Composition.—According to Tilden it consists of two neutral hydrocarbons, isomers of terebinthinene. In its reactions it closely resembles turpentine.

Therapeutics.—Antiseptic, vermifuge, diuretic.

Official Preparation.—Vapor Olei Pini Sylvestris.

No. 197. Terebinthina Canadensis. *Canada Turpentine.*

Synonym:—Canada Balsam.

The turpentine obtained by puncturing or incising the

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bark of the trunk and branches of Pinus balsamea (Abies balsamea).

Habitat.—The balsam fir is indigenous to Canada and the Northern United States.

Collection.—This species secretes the turpentine chiefly in the bark. In collecting the turpentine the operator pierces the vesicles with a sharp pointed tube forming a spout to a tin vessel, into which it flows. The trees are allowed a rest of three or four days before they are again punctured. A tree yields about half a pint at a time. Canada turpentine is principally collected in the province of Quebec.

Characters.—Canada turpentine is a pale yellow or faintly green tinted, transparent, slightly fluorescent, viscid liquid; odour agreeably terebinthinate; taste somewhat bitter and acrid. On exposure it dries up, forming a transparent mass. It is readily soluble in chloroform or ether, and incompletely so in glacial acetic acid or absolute alcohol.

Composition.—It consists of a volatile oil and resin, which is slightly different from that of other turpentines.

The Volatile Oil constitutes about 20 per cent. of the turpentine, and is closely related to terebinthinene, but differs in containing a minute quantity of an oxygenated oil.

Official Preparations.—Charta Epispastica, and Collodium Flexile.

No. 198. Pix Burgundica. *Burgundy Pitch.*

The prepared resinous exudation obtained from the stems of Pinus Picea (Pinus Abies; Abies excelsa).

Habitat.—P. Picea, the Norway Spruce Fir, is indigenous to Central and Northern Europe.

Production.—Burgundy Pitch is collected in Switzerland, Germany, Austria, and Finland. It is collected by making short, deep incisions into the trunk of the tree and collecting the turpentine as it exudes. It is then purified by melting in hot water and straining. The strained mass is heated for a short time to expel moisture.

Characters.—Burgundy Pitch is in hard, brittle masses of a dull yellowish or reddish-brown colour. It is opaque, and breaks with a conchoidal fracture, the fractured surface having an agreeable balsamic odour, which is increased on heating. Taste, aromatic and devoid of bitterness. It is readily soluble in glacial acetic acid, strong alcohol, or acetone.

Composition.—Burgundy Pitch contains an essential oil isomeric with terebinthinene, the resin consists principally of abietic acid, and a portion which is amorphous.

Adulteration.—As met with in English commerce, Burgundy Pitch consists of a mixture of turpentine, resin, fat, and palm oil, which are melted together, and finally water is stirred in to render the mixture opaque. When warmed with glacial acetic acid it forms a turbid mixture.

Official Preparations.—Emp. Ferri, and Emp. Picis.

No. 199. Pix Liquida. *Tar.*

A bituminous liquid obtained from the wood of Pinus sylvestris and other species of Pinus by destructive distillation.

Habitat.—The bulk of the tar is prepared in Russia, Finland and Sweden.

Preparation.—Pine wood which is unfit for timber is cut into logs and piled up in stacks, so arranged as to produce slow draughts, and ignited. The combustion is regulated so that flame is scarcely visible, the products pass downwards, and are collected in a cavity made for the purpose. A more economical process is to submit the wood and roots to distillation in iron retorts, whereby all the products are obtained.

Characters.—Tar is a dark-brown or blackish viscid liquid, transparent, with an empyreumatic odour, and pungent bitter taste. After standing for some time it deposits aggregations of crystals of pyrocatechin; when agitated with water the solution is of a brown colour, acid in reaction, and sharp taste.

Composition.—Tar consists of a complex mixture of hydrocarbons, acids, phenols, and paraffins. When fractionally distilled, the light oil contains acetic acid, methyl alcohol, acetone, toluol, xylol, phenol, creasol, and naphthalene.

Allied Products.—Juniper Tar, Huile de Cade.—This product was originally obtained by destructively distilling the wood of Juniperus oxycedrus; that which is now met with in commerce is principally obtained from the common juniper wood.

Official Preparation.—Unguentum Picis Liquidæ.

No. 200. Fructus Juniperi. *Juniper Fruit.*

The dried full-grown unripe green fruits, fleshy galbuli, of Juniperus communis.

Habitat.—Indigenous to Europe.

Characters.—Juniper fruits are globular, of a dark purple colour when ripe, but green during the first year. They are usually composed of three succulent carpellary leaves, which become united together, the union being marked by a tri-radiate groove at the apex; these enclose three hard seeds which are partially attached to the base of the leaves. Towards the base of the seed there are situated several prominent sacs containing oil. The fruit has an aromatic odour, with a sweet balsamic taste.

Composition.—The fruit contains a volatile oil, sugar, resin, juniperin, wax, and pectin, malic, formic, and acetic acids.

Commerce.—Juniper fruit is principally collected in Austria, and on a smaller scale in Savoy and Italy.

Therapeutics.—Diuretic.

Official Preparation of the Oil.—Spiritus Juniperi.

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No. 200a. Sandarach. *Juniper resin. Gum Juniper.*

A gum resin obtained from the Arar tree, Callitris quadrivalis.

Habitat.—Morocco and N. Africa.

Uses.—Largely used as an ingredient in varnishes. In powder it is called *Pounce.* The wood is used for floors and ceilings.

Characters.—Occurs in elongated tears, with a glassy fracture, transparent, of a pale yellow colour, and almost entirely soluble in alcohol. When masticated it is brittle and pulverulent, with a marked terebinthinate taste. These characters distinguish it from Mastich.

No. 201. Sabinæ Cacuminæ. *Savin Tops.*

The fresh and dried tops of Juniperus Sabina. Collected in spring from plants cultivated in Britain.

Habitat.—It grows throughout the greater portion of Europe, and in some districts of North America.

Characters.—Savin tops consist of young, thin, angular twigs, densely covered with minute, imbricated, adpressed, dark green (or, when dried, yellowish-green) leaves, with an oval depressed central gland at their back. Odour, persistent and strong; taste, bitter and disagreeable. The savin of commerce is frequently mixed with the fruits (galbuli) about the size of a pea, which contain from one to four seeds.

Composition.—Savin tops contain an essential oil, tannin, resin, and chlorophyll.

The Volatile Oil is the most important constituent of the plant, and is obtained by distilling the fresh branches with steam; the yield being about 2·5 per cent. The fruits yield 10 per cent. of the same oil. It is generally of a pale yellow colour, possessing in a marked degree the odour and taste of the plant. It dissolves in absolute alcohol in all proportions; when powdered iodine is added, energetic action ensues, sometimes accompanied by detonation.

Therapeutics.—Emmenagogue. The ointment forms a stimulating dressing for blisters.

Official Preparations.—Ol. Sabinæ; Tinct. Sabinæ; Ung. Sabinæ.

No. 202. Laricis Cortex. *Larch Bark.*

The bark of Pinus Larix (Abies Larix), collected in spring, deprived of its outer rough portion and dried.

Habitat.—Indigenous to the forests of Southern and Central Europe, and grown to a considerable extent in Scotland and England.

Characters.—The bark is in flattish pieces or quills, of varying sizes and lengths. A large portion of that taken from the older wood, consisting of the suberous layer, exfoliates, leaving the exposed surface of a roseate hue and uneven. The inner surface is smooth, yellowish-white or pinkish-red, fracture fibrous. Odour balsamic and terebinthinate; taste, astrigent.

Composition.—Larch bark contains a tannin, resin, and larixinic acid.

The Tannin exists in larch bark to a considerable extent; its solution gives an olive green precipitate with ferric chloride, and on boiling with dilute sulphuric acid it becomes red, but yields no sugar.

Therapeutics.—Astringent and styptic.

Other Products of the Larch.—Terebinthina Veneta (*Venice Turpentine*). This is obtained by boring a hole into the centre of the trunk, after which it is closed up for some time, and then opened; the turpentine is then removed by means of a spoon. It is a thick, viscid liquid, which on exposure to the air slowly dries, forming a clear varnish. Venice turpentine is rarely imported into England; what is used is a mixture of rosin and turpentine.

Official Preparation.—Tinctura Laricis.

No. 202a. Succinum. *Amber.*

(Not official.)

A fossil resin which is the exudation of various extinct coniferous trees, Baltic amber being derived chiefly from Pinites succinifer.

Habitat.—It is mainly obtained by digging on the south-eastern coast of the Baltic.

Characters.—It is hard, brittle, yellow or brown, translucent or transparent, fracture conchoidal; it readily dissolves in chloroform, sparingly in ether.

Composition.—Amber consists of a resin which on distillation yields the oil of amber of trade, this oil consisting of a number of hydrocarbons.

Class II. MONOCOTYLEDONS.

ZINGIBERACEÆ.

No. 203. Zingiberis Rhizoma. *Ginger Rhizome.*

The scraped and dried rhizome of Zingiber officinale (Amomum Zingiber).

Habitat.—Indigenous to Tropical Asia, where it is also cultivated on a large scale. It has been introduced into several tropical countries, and is cultivated largely in South America, Australia, the West Indian Islands, and Tropical Africa.

Production.—Commercial ginger is met with in two forms, and is known under the names of coated or uncoated. The pieces of the rhizome are called *hands or races.* Coated ginger consists of the rhizomes, from which, after removal from the ground, the remains of the leaves are removed by paring; they are then washed, and very slightly scraped on the flattened sides, and dried either in the sun or by means of a slow fire.

Uncoated or scraped ginger consists of the rhizomes, which are first washed, then freed from the remains of the leaves, scraped by means of a blunt knife, rewashed, and finally dried in the sun. It is sometimes submitted to the fumes of burning sulphur, or large tubs are filled with the fresh scraped rhizomes, and then filled up with a solution of chlorinated lime; after soaking in this solution for some time, they are removed, washed with cold water, and dried. As met with in commerce it is frequently coated with a white layer. This arises from the method adopted of whitening the ginger by dipping the pieces into milk of lime or a thin cream of gypsum and water.

Characters.—Coated ginger occurs in pieces from 2 to 8 inches in length, of a brown colour externally, slightly annulated from the remains of the leaf-bases, wrinkled, and somewhat shrivelled; internally of a dark colour; the fractured surface is horny and resinous. It is sometimes known as black ginger.

Uncoated or scraped ginger is met with in flattish, irregularly branched pieces; of a pale-buff colour externally, smooth and striated. The pieces vary in length, but are generally about 4 inches long. It breaks readily, and the fractured surface is mealy and fibrous; the colour is pale yellow. The odour of ginger is agreeable and aromatic; the taste strong, pungent, and aromatic.

Composition.—Ginger contains several resins, an essential oil, gingerol, traces of an alkaloid, starch, and mucilage.

Gingerol is obtained from the alcoholic solution after removal of the resins with lime, on carefully evaporating the residue. It is purified by treatment with hot petroleum ether, and quickly decanting, when it deposits in oily drops on cooling. It is a pungent, viscid fluid, of a pale straw colour, odourless, but strongly pungent and of a bitterish taste. Gingerol is alkaline in reaction, darkens when heated, and is decomposed with boiling water; nitric acid converts it into a blood-red resinous mass.

Commerce.—Ginger is largely imported from Jamaica, Cochin China, the West Coast of Africa, Egypt, and India. Jamaica ginger is usually esteemed as the best, and yields a yellowish powder.

Zingiberaceæ.

Therapeutics.—Carminative.

Official Preparations.—Conf. Opii; Conf. Scammonii; Inf. Sennæ; Pil. Scillæ Co.; Pulv. Cinnamomi Co.; Pulv. Jalapæ Co.; Pulv. Opii Co.; Pulv. Rhei Co.; Pulv. Scammonii Co.; Syr. Zingiberis; Tinct. Zingiberis; Tinct. Zingiberis Fortior; Vin. Aloes.

No. 204. Cardamomi Semina. *Cardamoms.*

The dried ripe seeds of the Malabar Cardamom, Elettaria Cardamomum.

Habitat.—The plant is indigenous to Hindustan, and is largely cultivated in the forests of Mysore, and at Coorg and Wynaad on the Malabar coast.

Productions.—The cardamoms are collected during the dry season. The fruits are borne on a scape, which is gathered when only a portion of them are ripe. The scapes are laid out on trays, and after two or three days the fruits are removed, and are then completely dried, either in the sun or by means of a gentle heat.

Characters.—The fruits are of an ovoid or oblong shape, three-sided, and rounded at the base, varying in length from a quarter to one inch, and in commerce are divided into shorts, short-longs or mediums, and longs. The capsule is three-valved, terminating in a beaked apex, the pericarp is thin and leathery; from the middle of each projects a thin septum, forming three loculi, containing about 8 seeds, arranged in two rows.

The seeds are about one-sixth of an inch long, irregularly angular, transversely rugose, with a depressed hilum, and a deeply grooved raphe. The seed is enclosed in a thin, membranous, nearly colourless arillus; the embryo is club-shaped, with the radicle pointing towards the hilum, and is surrounded with a more or less granular perisperm. Externally they are of a dark reddish-brown colour, but whitish within, with an aromatic and warm taste; odour agreeably aromatic.

Composition.—Cardamom seeds contain an essential oil, a fixed fatty oil, a colouring principle, starch, and gummy matter.

The Essential Oil is obtained by distilling the crushed seeds with water, or by passing a current of steam through the mass; the aqueous distillate also contains acetic acid. The seeds yield nearly 5 per cent. of this oil. It is colourless or of a pale yellow, and possesses in a high degree the odour and taste of the seeds. Sp. gr. about ·93.

Varieties of Cardamoms.

Ceylon Cardamoms are nearly an inch and a half in length, with a long pointed apex. These are frequently imported.

Bengal Cardamoms are about an inch in length, and the fruit has nine narrow wings, the apex terminating in a nipple. The fruits are of a dark brown colour.

Java Cardamoms are about an inch to an inch and a half in length, with four wings, apex terminating in a tube.

Round or Siam Cardamoms are globular, and about the size of a small cherry. The seeds have a strong camphoraceous taste. The last three varieties come only occasionally into the London market.

Therapeutics.—Carminative.

Official Preparations.—Ext. Colocynthidis Co.; Pulv. Cinnamomi Co.; Pulv. Cretæ Aromat.; Tinct. Cardamomi Co.; Tinct. Gentianæ Co.; Tinct. Rhei; Vin. Aloes.

No. 205. Curcumæ Rhizoma. *Turmeric.*

The dried rhizome of Curcuma longa.

Habitat.—Indigenous to Southern Asia, largely cultivated in British India and the East Indian Islands.

Characters.—As met with in commerce, turmeric is found in two forms, the round and the long. The central portion of the rhizome usually becomes thickened, and sends off numerous lateral shoots, which usually become fusiform and thickened towards their apex. Round turmeric consists of the central portion; it is about two inches in length, and is either globular, pyriform, or oblong, and generally pointed at the upper end. It is marked externally with numerous annulated scars. It is of a dull yellowish-grey colour externally, and breaks with a resinous fracture; the fractured surface is of a brown-yellow colour, which is darker towards the centre; the odour is aromatic; the taste is warm, aromatic, and bitterish. Long turmeric occurs in cylindrical pieces, somewhat curved and annulated, and consists of the lateral rhizomes.

Composition.—Turmeric contains an essential oil, curcumin, a viscid oil, resin, gum, and starch.

Commerce.—Turmeric is imported from various Asiatic countries, and the varieties met with in commerce are known as Chinese, Bengal, Madras, Cochin-China, and Java. They differ somewhat in their colour and appearance.

Official Preparation.—Tinct. Curcumæ.

No. 206. Galangæ Rhizoma. *Galangal.*

(Not official.)

The rhizome of Alpinia officinarum.

Habitat.—Indigenous to Southern China and the Island of Hainan, where it is also cultivated.

Characters.—The rhizome occurs in pieces about two inches in length, occasionally branched, and marked with numerous raised irregular rings. It is of a rusty brown colour externally, paler internally, and breaks with a fibrous fracture. Odour agreeable and aromatic, with a taste resembling that of ginger.

Composition.—Galangal contains a volatile oil, galangin alpinin, and galangol.

Allied Drug.—Greater Galangal is obtained from Alpinia Galanga, a native of Java. It is seldom met with in commerce, and is distinguished from the above by being much longer and thicker, and of a paler colour.

No. 207. Grana Paradisi. *Grains of Paradise.*

Synonym:—Semen Melegueta.

(Not official.)

The seeds of the ripe fruit of Amomum Melegueta.

Habitat.—Indigenous to the tropical districts of the West Coast of Africa.

Characters.—The seeds are contained in a scarlet coloured fruit about the size of a small pear. They are from one to two lines in diameter, roundish and angular; the hilum is depressed; they are glossy, and of a reddish-brown colour; the odour is aromatic, and the taste strongly pungent and burning.

Composition.—Grains of Paradise contain a volatile oil, paradol, resins, tannin, and gum.

IRIDACEÆ.

No. 208. Crocus. *Saffron.*

The dried stigmas and top of the style of Crocus sativus.

Habitat.—Indigenous to Persia and Asia Minor. It is largely cultivated at Alicante in Spain, Gatinais in France, and on a small scale in Austria.

Characters.—Saffron crocus has a style nearly four inches in length, but only a part of this is collected, which is the upper divided portion bearing three stigmas, as this alone is coloured; it rarely exceeds one inch in length. The stigmas are thickened and tubular, slit on the inner side, and the margins are notched. Dried saffron is flexible and tough, brownish-red in colour, unctuous to touch; the odour strong and aromatic; taste warm, aromatic and bitterish.

Composition.—Saffron contains an essential oil, crocin, picrocrocin, fat, wax, and albumen.

Adulteration.—This drug is very frequently adulterated, but most of the admixtures are easy of detection; amongst the more frequently found additions are the florets of Calendula officinalis, cut red poppy petals, the petals of the pomegranate, and stamens of the crocus ; the heavy powder sometimes found adhering to the stigmas consists principally of barium sulphate, gypsum, or chalk ; these latter are readily detected by the amount of the ash, and examination of its composition. Sometimes the flower of the marigold and other flowers which are used for sophistication, are dyed with dinitrocresylate of sodium. Saffron yields no colour to ether, but the above salt imparts a yellow tint. Saffron should be allowed to macerate in water for a short time, and then carefully examined, when any addition is easily recognized.

Commerce.—Several commercial names are used to distinguish either the source or variety of the saffron. Gatinais or French saffron is reputed the best, Spanish, Alicante or Valencia generally contains a large portion of the styles. When loose it is known as hay saffron, and when compressed as cake saffron ; the latter as now met with is principally the florets of the marigold. About 50,000 to 60,000 plants are required to yield one pound weight of dry saffron.

Official Preparations.—Dec. Aloes Co. ; Pil. Aloes et Myrrhæ ; Pulv. Cretæ Aromat. ; Tinct. Cinchonæ Co. ; Tinct. Croci ; Tinct. Opii Ammoniata : Tinct. Rhei.

No. 209. Iridis Rhizoma. *Orris Rhizome.*

(Not official.)

The dried and prepared rhizomes of several species of Iris, usually Iris pallida, Iris germanica, and Iris florentina.

Habitat.—Indigenous to Southern Europe and Western Asia, cultivated near Florence.

Characters.—The flattened rhizome is much branched, and occurs in pieces about four inches in length. The under surface is marked with numerous yellowish scars. As met with it is whitish externally, having been scraped to remove the dull external cortical layer. It breaks with an irregular fracture; odour resembling that of violets; taste aromatic and bitterish, afterwards producing an acrid sensation.

Composition.—Orris rhizome contains a small quantity of an essential oil, and myristic acid, commonly called orris camphor. Commercial oil of orris is prepared by macerating the rhizomes in cedar-wood oil, and then distilling it. Orris rhizome also contains an acrid resin and some starch.

SMILACEÆ.

No. 210. Sarsæ Radix. *Sarsaparilla Root.*

The dried root of Smilax officinalis, and probably S. medica and S. syphilitica.

Habitat.—Indigenous to Central America and the northern part of South America.

Collection.—The roots are generally collected from plants of several years' growth. The earth is first removed by scraping, and the roots are then dug up by means of a pointed stick. A portion of the root is always allowed to remain in the ground for further development. The earthy matter is removed, and they are then dried by the sun's heat, and finally made up into rolls.

Characters.—As met with in commerce, sarsaparilla root consists of a portion of the knotty rhizome, with the long trailing rootlets adherent to it. They are six feet or more in length, usually rolled into bundles about two feet long, and generally tied together with long roots of the same. The roots are cylindrical, somewhat furrowed, and tapering, their extremities covered with a blackish-brown or greyish cortical layer; the roots vary in thickness, but rarely exceed that of a goose quill. A transverse section shows several zones, the central one forming the pith. Sarsaparilla is inodorous; taste mucilaginous, slightly bitter, and acrid.

Smilaceæ.

Composition.—Sarsaparilla contains parillin, resin, traces of a volatile oil, saponin, gum, and starch.

Commercial Varieties of Sarsaparilla.—The Sarsaparillas are usually divided into two groups, viz. : those in which the starch predominates, and those where it is only in comparatively small amount—the first are known as mealy or gouty, and the second as non-mealy or bearded.

Non-mealy Sarsaparillas.—These comprise the Mexican or Vera Cruz, Jamaica, Lima, and the Venezuelan or Caraccas.

The Mexican, Vera Cruz, or Tampico Sarsaparilla generally occurs in bundles about a yard in length, with few rootlets, having a deeply wrinkled pale brown cortex. This is probably obtained from Smilax medica.

Jamaica Sarsaparilla is the only one recognized by the British Pharmacopœia, and is commonly called bearded.

Lima Sarsaparilla resembles that of Jamaica, but is of a paler colour, and is usually packed in cylindrical bundles.

Caraccas Sarsaparilla closely resembles the Jamaica, but differs in being more mealy.

Mealy Sarsaparillas.—These comprise the Honduras, Rio Negro, Guatemala, and Guayaquil.

Honduras Sarsaparilla occurs in bundles two or three feet in length. The roots are deeply grooved, the cortical zone being the thickest. They are usually covered with minute rootlets or " beard."

Rio Negro Sarsaparilla is generally known as the Brazilian, Lisbon, or Para. It is seldom met with in the London market. It is devoid of any stem portion, and has but few rootlets.

Guatemala Sarsaparilla closely resembles the Honduras, but is generally of a lighter and brighter colour. It is probably derived from Smilax papyracea. It is rarely imported.

Guayaquil Sarsaparilla resembles Honduras, but is not packed in bundles, has the rootstock attached, and the rootlets are few and coarse.

Liliaceæ.

Therapeutics.—Alterative.

Official Preparations.—Dec. Sarsæ; Dec. Sarsæ Co.; and Ext. Sarsæ Liq.

LILIACEÆ.

No. 211. Scilla. *Squill.*

The bulb of Urginea Scilla (Scilla maritima), divested of its dry, membranous outer scales; cut into slices and dried.

Habitat.—The squill is found growing on a silicious soil near the sea-shore of the basin of the Mediterranean.

Characters.—The squill bulb is pyriform and about six or eight inches in length, varying from one to four pounds in weight. After collection the bulbs are divested of the outer scales, stem, and rootlets, and are then cut transversely into thin slices, which are spread out and dried in the sun. The slices are in flattish pieces of a dull yellowish-white colour, sometimes tinged with a reddish hue; they are flexible, slightly translucent, and on drying become quite brittle and easily reduced to powder, which readily hardens into a mass because of its hygroscopic character. There are two varieties of the squill, white and red; the difference consisting merely in the colouring matter contained by the latter variety. The slicing of squills frequently gives rise to intense irritation of the skin: this is said to be occasioned by the minute acicular crystals of calcium oxalate.

Composition.—Several principles have been isolated from squill, chief amongst them being scillain, a bitter principle, sugar, and gum.

Therapeutics.—Expectorant and diuretic.

Official Preparations.—Acetum Scillæ; Oxy. Scillæ; Pil. Ipecacuanhæ cum Scillâ; Pil. Scillæ Co.; Syr. Scillæ; Tinct. Scillæ.

No. 211a. Allii Bulbus. *Garlic.*

The dried bulb of Allium sativum.

Liliaceæ.

Habitat.—Cultivated in Europe.

Characters.—The bulbs are nearly globular and encircled in a few membranous scales, which cover numerous minute bulbs, which consist of a number of fleshy scales; odour pungent, taste acrid and burning.

Composition.—Garlic contains sugar, mucilage, and an essential oil. The volatile oil consists of a mixture of allyl oxide and sulphide $(C_3H_5)_2S$.

Allied Species.—Allium cepa—*Onion.*

No. 211b. Convallaria. *Lily of the Valley.*

The entire plant of Convallaria majalis.

Habitat.—Indigenous to Europe.

Characters.—The plant consists of a creeping rhizome, throwing off two or three leaves and a small flower-stalk bearing about ten flowers.

Composition.—The plant yields on distillation a small quantity of volatile oil, which has a pleasant odour. The bitter principle is convallamarin.

No. 212. Aloe Barbadensis. *Barbadoes Aloes.*

The inspissated juice obtained from the leaves of Aloe vulgaris.

Barbadoes,

Habitat.—Aloe vulgaris is indigenous to India and North-Eastern Africa; it has been introduced and is cultivated in the West Indian Islands. [redacted]

Secretion.—The thick succulent leaves of this and other species of aloe are covered with a thick epidermis enclosing a mass of loose parenchymatous tissue. Between the mucilaginous pulp of the inside and the epidermis is a layer of thin tissue composed of numerous elongated, thin-walled ducts, containing a yellowish bitter juice, which on evaporating constitutes aloes.

Production.—The leaves are cut off at their base and immediately placed in a trough or suitable vessel with the cut end projecting downwards. The vessel is generally inclined, so that the juice, which quickly flows from the cut ends, flows down and runs into another vessel placed to receive it, in which it is kept until required for evaporation.

The evaporation is usually carried out in copper vessels, considerable care being observed to remove any impurities. When the proper degree of viscidity has been reached, the juice is ladled out into gourds or boxes, in which it solidifies on cooling.

Characters.—Barbadoes Aloes, as imported in gourds or boxes, is sometimes quite soft, but is generally met with in hard brittle masses, varying from a deep reddish-brown or chocolate-brown to almost black. When broken the fractured surface is generally dull and waxy, with a strong disagreeable odour, which is increased by breathing on the surface; in mass it is opaque, but thin splinters are somewhat translucent and of an orange-brown hue. Taste, nauseous and bitter; powder, dull olive-yellow.

Composition.—Barbadoes aloes and its varieties contain an essential oil, a characteristic aloin, and resins.

Barbaloin can be obtained easily by the method devised by Tilden, which consists in dissolving the aloes in ten times its weight of boiling water previously acidulated with hydrochloric acid, and allowing the liquid to cool. It is then decanted, evaporated to about one-quarter its bulk and set aside to crystallize. The yield varies from 10 to 20 per cent.

The Resins were examined by Tilden, who obtained, by prolonged boiling, a portion soluble in water. They appear to be closely related to aloin, of which they are considered to be anhydrides.

Therapeutics.—Purgative.

Official Preparations.—Aloin; Enema Aloes; Ext. Aloes Barbadensis; Pil. Aloes; Pil. Aloes et Ferri; Pil. Cambogiæ Co.; Pil. Coloc. Co.; Pil. Coloc. et Hyoscyami.

No. 213. Aloe Socotrina. *Socotrine Aloes.*

The inspissated juice obtained from the leaves of Aloe

Peryii and other species, of which A. Socotrina and A. Abyssinica are the most common.

Habitat.—The East Coast of Africa, Socotra, and Zanzibar. Bombay

Production.—Very little is known as to how this aloes is prepared. Dr. Balfour states that in the island of Socotra the natives dig a hole in the ground, into which they place the hide of an animal; the cut ends of the leaves are then arranged round the side, and as they discharge their contents they are removed and replaced by fresh leaves. Having collected a sufficient quantity, the hide is skewered up and carried some distance, where the juice is generally allowed to evaporate spontaneously in vessels.

Characters.—Socotrine or Zanzibar aloes is generally met with in commerce in kegs or boxes, and frequently in skins. Occasionally it is imported in barrels, in a liquid condition, and separates on standing into two layers, the upper one transparent and of a deep rich brown colour, the bottom layer consisting of a bright yellow crystalline mass. In mass it is of a reddish-brown colour, which darkens on keeping; fracture resinous, sometimes irregularly conchoidal; in thin splinters it is translucent and of a ruby red colour. Odour strong, but agreeable, slightly resembling saffron; taste, bitter; powder, tawny orange-brown. The masses are sometimes quite soft in the centre, opaque and liver-coloured.

Socotrine aloes is almost entirely soluble in alcohol or water, but only yields about 6 per cent. of its weight to ether.

Hepatic aloes is the name applied to the more opaque and inferior masses of Socotrine aloes.

Composition.—Socotrine aloes contains a peculiar aloin and resin, besides traces of an essential oil.

Socaloin, or Zanaloin, is prepared by adding alcohol to the powder in sufficient quantity to make a paste, and then submitting to strong pressure, and crystallizing the residual cake from warm weak alcohol. (Histed.)

Liliaceæ.

Commerce.—Socotrine or Zanzibar aloes is first shipped to Aden or Bombay, thence to this country.

Therapeutics.—Purgative.

Official Preparations.—Aloin ; Dec. Aloes Co. ; Enema Aloes ; Ext. Aloes Soc. ; Ext. Coloc. Co. ; Pil. Aloes et Asafœtidæ ; Pil. Aloes et Myrrhæ ; Pil. Aloes Soc. ; Pil. Rhei Co. ; Tinct. Aloes ; Benzoini Co. ; Vin. Aloes.

No. 214. Aloe Natalensis. *Natal Aloes.*

(Not official.)

The inspissated juice of the leaves of an undetermined species of aloe.

Habitat.—The upper districts of Natal.

Production.—This kind of aloes is prepared in a similar manner to Cape aloes, only greater care is taken in the manufacture, the juice being constantly stirred while boiling until it acquires the proper consistency.

Composition.—Natal Aloes contains a resin and a characteristic aloin.

Nataloin is prepared by triturating the aloes with an equal weight of alcohol warmed to 118° F., filtering, washing the crystalline mass with cold alcohol, and recrystallizing from boiling alcohol. (Flückiger.)

No. 215. Aloe Capensis. *Cape Aloes.*

(Not official.)

The inspissated juice of the leaves of Aloe ferox, A. spicata, and A. africana, and probably other species.

Habitat.—Indigenous to Southern Africa.

Production.—The juice is collected in a manner similar to that for Socotrine aloes, after which it is transferred to an iron pot, and evaporated down in a most careless manner, and then poured into boxes.

Characters.—Cape aloes is easily distinguished from the

Liliaceæ.

other varieties by its glossy appearance and dark brown colour, thin pieces being transparent. Odour strong, sour, and disagreeable; powder, greenish-brown or yellow. As imported it frequently varies in brilliancy of fracture. It yields to ether nearly 6 per cent. of its weight.

Composition.—Cape aloes is said to contain no aloin, but Kosmann isolated a crystalline principle having the formula $C_{34}H_{22}O_{20}$, the amorphous residue having the same composition.

Commerce.—Cape aloes is principally exported from Algoa Bay, Mossel Bay, and Cape Town.

No. 216. Resina Draconis. *Dragon's Blood.*

(Not official.)

A resinous exudation obtained by incising the stem of Dracæna Cinnabari, Dracæna Draco, and other species.

Habitat.—Indigenous to the Islands of Socotra, Teneriffe, and to the mountainous districts of Eastern Africa.

Characters.—This resin, which is seldom met with, is in roundish tears, or a coarsely granular powder of a deep red colour, melting at about 90° C.; emitting aromatic pungent fumes. It is soluble in ether or alcohol, forming a blood-red solution, insoluble in benzine or chloroform, but is readily dissolved by a solution of the alkaline hydrates.

Composition.—Resin and a minute trace of cinnamic acid.

Other Varieties of Dragon's Blood.

The bulk of the dragon's blood used in commerce is obtained from the fruits of Calamus Draco (*Nat. Ord. Palmæ*), indigenous to the East Indian Islands. It is prepared by shaking the fruits in a bag, when the resin breaks off; it is then collected and made into cakes or sticks. An inferior quality is obtained by bruising the fruits and boiling them with water, skimming off the resin, and rolling it into masses. It is a dark red-brown substance in rolls or cakes, somewhat porous, breaking with a resinous fracture. It melts at 80° C., giving off highly irritating fumes; it is soluble in ether, benzine, chloroform, or turpentine.

Composition.—An acid resin.

MELANTHACEÆ.

No. 217. Colchici Cormus. *Colchicum Corm.*

The fresh corm of Colchicum autumnale, collected about the end of June or beginning of July.

Habitat.—Indigenous throughout Europe.

Collection.—The corms are dug up just as the foliage is decaying. They are then thinly sliced across, and the sections dried by a gentle heat; the outer papery membranes are removed by winnowing or sifting.

Characters.—The fresh corms are about one inch and a half long and an inch broad, convex on one side, flattened and with a groove on the other; after removal of the brown membranous scales, the exposed surface has an ashy-grey colour; internally solid and white. The dried slices are slightly reniform, surface white and starchy; breaking with a short fracture; taste sweet, acrid, and then bitter.

Composition.—The corms contain about 10 per cent. of starch, tannin, resin, sugar, and also colchicin, which is the active constituent of the drug. On drying they lose between 60 and 70 per cent. of moisture.

Therapeutics.—Sedative, anti-rheumatic.

Official Preparations.—Ext. Colchici; Ext. Colchici Aceticum; Vin. Colchici.

No. 218. Colchici Semina. *Colchicum Seeds.*

The seeds of Colchicum autumnale, collected when fully ripe, which is about the beginning of August, and carefully dried.

Characters.—Colchicum seeds are about one-twelfth of an inch in diameter, globular, slightly pointed at the hilum, the testa being of a dull reddish-brown colour and finely pitted. They are inodorous, and have a bitter, acrid taste; very hard, and with difficulty reduced to powder. Hertel and Morris have shown that unbroken seeds yield to solvents a greater proportion of the active constituents.

Composition.—Colchicum seeds contain colchicin, sugar, and a fatty oil.

Therapeutics.—Sedative and anti-rheumatic.

Official Preparation.—Tinctura Colchici Seminum.

No. 219. Sabadilla. *Cevadilla.*

The dried ripe seeds of Schœnocaulon officinale (Asagræa officinalis).

Habitat.—Indigenous to Eastern Mexico, also to Guatemala and Venezuela. The seeds are alone imported from Venezuela, and the fruits from Mexico.

Characters.—The fruit consists of three brown papery follicles half an inch long, each containing two seeds about one-third of an inch in length, narrow, flattened, and angular on one side, apex pointed; testa rugosely wrinkled, shining, and blackish-brown in colour. The seeds are inodorous; but have a bitter and acrid taste, and the powder is sternutatory.

Composition.—Cevadilla contains a fat, veratrine, veratric acid, and sabadillic acid.

Therapeutics.—Used for neuralgia.

Official Preparation.—Veratrina.

No. 220. Veratri Viridis Rhizoma. *Green Hellebore Rhizome.*

The dried rhizome and rootlets of Veratrum viride.

Habitat.—Indigenous to the swampy districts of Canada and the United States.

Characters.—The rhizome is met with either entire or in transversely or longitudinally sliced pieces with or without the rootlets. The rhizome when entire is about two or three inches in length and nearly an inch in diameter; erect, obtuse, or truncate at the apex; dark-brown externally, white within. The upper end has frequently the remains of numerous leaves attached to it. The rootlets are of a yellowish-white colour, much shrivelled, and usually two or three inches long. It is inodorous, but has a bitter and acrid taste.

Composition.—Several alkaloidal bodies, including jervine, pseudo-jervine, rubi-jervine, veratrine, and cevadine.

The rhizome is said to contain gallic acid.

Therapeutics.—Used to lower the action of the heart in fevers, &c.

Official Preparation.—Tinctura Veratri Viridis.

No. 221. Veratri Albi Rhizoma. *White Veratrum Rhizome.*

(Not official.)

The dried and sliced rhizome with the rootlets of Veratrum album.

Habitat.—The mountainous districts of Middle and Southern Europe, also some districts of the United States.

Characters.—The rhizome is erect, obconical, and of a dull earthy black colour, about three inches long, tufted above with the remains of leaves, the lower half marked with scars of old rootlets. Commercially the drug is met with having the rootlets removed and the rhizome cut off close to the summit, and is sometimes cut transversely. It has a sweetish, bitter, acrid taste, followed by a sensation of numbness; its powder is a powerful sternutatory.

Composition.—This drug is similar in composition to Green Hellebore, but contains in addition the alkaloid veratralbine.

ARACEÆ.

No. 222. Calami Aromatici Rhizoma. *Sweet Flag Rhizome.*

(Not official.)

The rhizome of Acorus Calamus freed from its rootlets.

Graminaceæ.

Habitat.—The plant grows wild throughout Europe, Central Asia, and North America.

Characters.—Sweet flag rhizome is met with in pieces from several inches to a foot or more in length, marked with numerous annulations on its upper surface, and circular root-scars on its lower surface. It is reddish-brown in colour externally, and of a pale pinkish hue internally. It presents a rough and wrinkled appearance, and breaks with a short, corky fracture. Texture, spongy; odour, agreeably aromatic; taste, aromatic and bitter.

Composition.—The rhizome contains an essential oil, a bitter principle, resin, gum, and starch.

Commerce.—Sweet Flag is imported from Northern Germany and Southern Russia; little if any is now collected in England.

GRAMINACEÆ.

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No. 223. Saccharum Purificatum. *Refined Sugar.*

Synonyms:—Sucrose, Saccharose.

The refined sugar of Saccharum officinarum.

Habitat.—The sugar cane is probably a native of India, but is not now found in the wild form. It is cultivated more or less in tropical and sub-tropical countries, particularly in South America, India, and Mexico. Several varieties are known, differing chiefly in colour and hairiness of the stems.

Manufacture.—The sugar canes are heated in a current of steam and then submitted to pressure in a rolling mill, when the juice is obtained; this flows through a metallic sieve into a copper boiler known as the clarifier. The juice is heated in the cauldron, and when the temperature reaches 130° F., a certain amount of milk of lime is added, which causes a thick scum to rise to the surface when the juice is boiling. The juice is then strained into a second pan and again boiled, and a second scum removed; it is run into others of smaller dimensions and evaporated to the point of crystallization. The evaporation is chiefly carried out now by means of pipes heated with steam, and the sugar so obtained is known as raw or muscovado sugar; the dark mother liquor constitutes the molasses or treacle, from which a large quantity of sugar is obtained by means of strontium hydroxide.

Refining or Purification.—The raw sugar is dissolved in water, heated with steam pipes, and the impurities removed by an addition of milk of lime, albuminous substances, or animal charcoal. The clarified solution is then filtered through bags, and afterwards through animal charcoal filters to remove colouring matter, whence it passes into vacuum pans. The evaporation in the vacuum pans is carried on until it becomes somewhat granular; after which it is run into moulds, one end of which is perforated to allow the syrup to drain away. When crystals are to be prepared, the solution is run into the sieve of a centrifugal machine and the syrup removed by this means.

Characters.—Cane sugar is sold in compact crystalline masses, known as loaf sugar. It dissolves readily in cold water and in almost all proportions in boiling water, forming a clear bright sirupy liquid; it dissolves sparingly in alcohol, but more freely when warmed. Its aqueous solution deviates a ray of polarized light to the right; it forms a compound of feeble affinity with chloride of sodium and the hydrates of the alkaline earth metals.

Composition.—Cane sugar, when pure, is a carbo-hydrate. having the composition $C_{12}H_{22}O_{11}$; it melts at 320° F., and if kept melted, becomes changed into glucose and levulosan; at a higher temperature it is decomposed, yielding caramel.

Other Sugars.—Beet sugar, or Betose, obtained from the juice of Beta vulgaris (*Nat. Ord. Chenopodiaceæ*). This is cane sugar, and is obtained by a similar process to that employed for the sugar cane, only the crude molasses from this source of sugar is destructively distilled, whereby a considerable amount of methyl-alcohol and other products are obtained, the ash being principally potash salts.

Graminaceæ.

Cane sugar is also found in the maple and several graminaceous plants.

Grape sugar, or Glucose, is contained in grapes, but this sugar is artificially prepared from oats by hydrolizing the starch by means of dilute sulphuric acid. It is manufactured on a large scale in America. It is distinguished from cane sugar by its feebler sweetening properties, its powerful reducing action on Fehling's solution, and by turning a solution of potash brown.

Official Preparation.—Syrupus.

No. 224. Hordeum Decorticatum. *Pearl Barley.*

The dried seed, divested of its integuments, of Hordeum distichon.

Habitat.—Indigenous to Western Asia. Cultivated throughout Europe and America.

Preparation.—The fruits are carefully ground or reduced in size by passing between horizontal mill-stones until they become nearly rounded and free from the whole of the integuments.

Characters.—Pearl barley is white, rounded or elliptical in shape, with a trace of the longitudinal furrow to which are attached fragments of the integuments. It is incdorous; the taste is farinaceous and insipid.

Composition.—Pearl barley contains nearly 70 per cent. of starch, and about 15 per cent. of proteids, with a small quantity of an oil consisting of the glycerides of lauric and palmatic acids; and about 6 per cent. of dextrin. On incineration the ash amounts to nearly 3 per cent.

Official Preparation.—Decoctum Hordei.

No. 225. Amylum. *Starch.*

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The starch procured from the grains of the common wheat, Triticum sativum; maize, Zea Mays; and rice, Oryza sativa.

Habitat.—Wheat and maize are cultivated in tropical and subtropical countries. Rice is a native of India, and is cultivated in tropical countries.

Preparation.—The grain is first soaked in water to which a little caustic soda has been added, and when soft it is crushed between rollers and coarsely ground, after which it is placed in vats, when fermentation takes place. Several acids are thus formed, and the gluten loses its tenacity. The mass is then poured into a perforated cylinder, which is rotated, the milky liquid which passes through is allowed to settle in a vat, and the starch washed several times by decantation. It is then dried in a warm room and reduced to fine powder by grinding.

Characters.—Starch is a white inodorous powder in angular or columnar masses; it is slippery when rubbed between the fingers, and emits a peculiar crackling noise; it is devoid of taste, and when triturated with water and then boiled, it forms a gelatinous mass, which on cooling gives a deep blue colour with iodine. Examined under the microscope the official varieties present the following characters:

No. 1. Wheat Starch.—A mixture of large and small granules, lenticular in form, and marked with faint concentric striæ, surrounding a nearly central hilum.

No. 2. Maize Starch. — Granules uniform in size, frequently polygonal, rounded on the edges, about two-thirds the size of wheat starch, hilum distinct and slit, striæ indistinct.

No. 3. Rice Starch.—Granules extremely minute, uniform in size, polygonal, hilum small and without striæ usually aggregated with larger grains.

Composition.—Starch granules consist of two distinct carbohydrates having the formula $C_{18}H_{30}O_{15}$, the outer film is called cellulose or amylin, and the inner portion granulose, farinose, or amidin. The former gives a brown and the latter a deep blue colour with iodine; when heated at high temperatures it changes colour and is converted into dextrine.

Official Preparations.—Glycerinum Amyli; Mucil. Amyli;

Graminaceæ.

Pulv. Tragacanthæ Co.; Suppos. Acidi Tannici cum Sapone; Suppos. Morphinæ cum Sapone.

No. 226. Graminis Rhizoma. *Couch Grass.*

(Not official.)

The rhizome of Triticum repens (Agropyrum repens) deprived of its rootlets.

Habitat.—Indigenous to Europe.

Characters.—Couch Grass, or Quitch, as met with in commerce, is cut into small sections, pale yellow in colour, hollow in the centre, smooth, inodorous, but having a faint sweetish taste.

Composition.—Couch Grass contains a minute quantity of sugar, and a peculiar principle, triticin.

No. 227. Farina Tritici. *Wheaten Flour.*

The grain of Triticum sativum ground and sifted.

Habitat.—Cultivated in this country, probably indigenous to Central Asia.

Characters.—Wheaten flour is a fine, nearly white powder, somewhat gritty to the touch, with a distinct farinaceous odour and taste.

Composition.—It consists principally of starch with varying proportions of gluten.

Gluten is best prepared by kneading the flour in a linen bag under water until the liquid is nearly colourless, when it is left as a strongly adhesive mass. It is purified by dissolving it in dilute potash solution, filtering and precipitating with acetic acid. The precipitate is repeatedly treated with alcohol and then washed with ether, the residue being gluten-casein.

Official Preparation.—Cataplasma Fermenti.

Sub-Class ACOTYLEDONES.

FILICES.

No. 228. Filix Mas. *Male Fern.*

The rhizome with the persistent bases of the petioles of Aspidium Filix-mas.

Habitat.—The male fern is indigenous all over Europe, and in certain districts of the United States.

Characters.—The rhizome or caudex is from three to six inches in length, and about one inch in diameter. When fresh it is green and fleshy, but on drying it becomes hard and of a reddish-brown hue externally, and covered with the hard persistent curved bases of leaf stalks, which are of a dark colour. A transverse section is of a light brown colour, and shows generally eight fibro-vascular bundles. Odour disagreeable; taste astringent and sweetish, subsequently nauseous. It should be collected late in the autumn and divested of scales, roots, and all dead portions, and carefully dried by a gentle heat. It should not be used if more than a year old.

Composition.—Male fern rhizome contains a fatty oil, resin, tannic acid, gum, and starch.

Therapeutics.—Anthelmintic.

Official Preparation.—Extractum Filicis Liquidum.

FUNGI.

Sub-Order ASCOMYCETES.

No. 229. Ergota. *Ergot.*

The sclerotium of Claviceps purpurea produced between the pales and replacing the grain of Secale cereale.

Habitat.—It is collected chiefly in Spain and Southern Russia.

Development.—The development of this fungus takes place in three distinct stages. At the flowering season one or more of the ovaries becomes enveloped in a thick yellowish sweet coating called the "honey-dew of rye." This honey-dew contains a large quantity of sugar which quickly reduces Fehling's solution; it consists of numerous minute cells or conidia; these are formed by the growing mycelium of the young fungus. This mycelium is composed of numerous filamentous cells or hyphæ, with an outer layer of diverging cells or basidia, which form the hymenium by which it is separated from the conidia. In this condition the ergot is known as the sphacelium or primary stage. The hyphæ of the sphacelium now unite into a compact body at the base of the ovary, which grows rapidly towards its apex forming a purplish-black body, which, when full grown, is called the sclerotium. By such a method of growth the caryopsis of the rye becomes completely destroyed, and is not merely transformed into the fungus. The ergot, if kept for several months, will complete its final stage by developing the mature fungus, which resembles a mushroom in miniature, but contains cavities called perithecia. These contain numerous spore sacs or asci, which are discharged from the conceptaculum about the time the rye is in flower.

Characters.—Ergot is a sub-cylindrical or fusiform body, about one inch in length, generally curved and tapering towards the ends. Externally it is a purplish-black colour; internally whitish; frequently fissured and longitudinally furrowed. Odour disagreeable and heavy, particularly if moistened with solution of potash; taste oily, mawkish, rancid, and unpleasant. It is best preserved kept quite dry in bottles and sprinkled with chloroform.

Composition.—Ergot contains a multiplicity of uncrystallizable principles, a fatty oil, resin, and cholesterin.

Therapeutics.—Uterine stimulant.

Official Preparations.—Ext. Ergotæ Liq.; Inf. Ergotæ; Tinct. Ergotæ.

No. 230. **Cerevisiæ Fermentum.** *Beer Yeast.*

The ferment obtained in brewing beer, and produced by Saccharomyces cerevisiæ.

Characters.—Yeast consists of numerous round or elliptical cells, varying in size, and, as obtained during fermentation of beer, it is viscid, semi-fluid, and frothy, and has a peculiar odour and bitter taste.

There are two varieties of yeast, known in commerce as top and bottom yeast; the former is the one principally obtained in this country.

Composition.—Yeast is said by some to contain a peculiar principle called invertin, which was isolated by Barth, by digesting dried yeast in water, and then pouring the filtrate into a large excess of alcohol, when it is precipitated. When dried it constitutes a brown amorphous mass.

Official Preparation.—Cataplasma Fermenti.

LICHENES.

No. 231. **Cetraria.** *Iceland Moss.*

The dried lichen, Cetraria Islandica.

Habitat.—Indigenous to northern latitudes.

Characters.—The plant is foliaceous, erect, irregularly branched in a dichotomous manner into fringed, obtuse, flattened lobes; crisp, smooth, and generally of a brownish or greyish-white colour on the upper surface; lower surface whitish, with numerous depressed spots. It is almost odourless when dry; when moistened it becomes cartilaginous and leathery, has a slight odour, and a bitter mucilaginous taste.

Composition.—It contains about 70 per cent. of lichenin starch. Small quantities of cetraric acid (a bitter principle) are present, with varying proportions of lichen-stearic, oxalic and fumaric acids, and thallo-chlor, a peculiar chlorophyll.

Therapeutics.—Demulcent.

Official Preparation.—Decoctum Cetrariæ.

No. 232. Lacmus. *Litmus.*

A blue pigment obtained from Roccella tinctorea, R. fuciformis, and other species.

Preparations.—The lichen is reduced to powder and then mixed with caustic potash and urine, or any ammoniacal fluid, and exposed to the air for some time. The solution passes through several shades of colour, but finally acquires a blue colour; it is then mixed with chalk, made into a paste and cut into small square blocks.

Characters.—Litmus is generally sold in small friable cakes of a deep blue colour, which effervesce strongly on the addition of an acid. It has a saline and pungent taste; the aqueous infusion is turned red by acids.

ALGÆ.

No. 233. Chondrus. *Irish or Carrageen Moss.*

(Not official.)

The dried entire plant of Chondrus crispus.

Habitat.—Indigenous to Northern Europe.

Characters.—Carrageen in the fresh condition is soft and cartilaginous, and is of a purplish colour, which becomes lighter on washing; when dried it shrinks into a horny translucent membrane. The thallus is from 3 to 6 inches long, with a slightly cylindrical stem expanding like a fan; it has a seaweed-like odour and saline taste.

Composition.—It consists principally of mucilage, which yields mucic acid on treatment with nitric acid.

No. 233a. Fucus Vesiculosus. *Bladder Wrack.*

(Not official.)

The entire plant, Fucus vesiculosus.

Algæ.

Habitat.—Found on the coasts of Britain.

Characters.—The plant consists of a long, much branching thallus, with an entire margin and a prominent midrib, brown to green in colour when fresh, but black on drying, air vesicles in pairs, and the fructification situated at the extremities of the branches; odour characteristic of seaweed, taste saline and mucilaginous.

Composition.—Like most seaweed it contains minute quantities of iodine and bromine, a bitter substance, algin and alginic acid, and mannite.

forming a [illegible] acid and man-
Hydrolysis.

PLANT CONSTITUENTS.

GLUCOSIDES.

Amongst the numerous products found in the tissues of plants are a class known as glucosides, which are ethereal or saline compounds of dextrose. The glucosides found in plants have never been produced artificially, but a series of compounds analogous to them can be formed when glucose and the fatty or aromatic acids are heated together for some time, the temperature being maintained at 120° C. Mannitanides are thus modified glucosides. According to Berthelot, they are derivatives of glucosan, because, when decomposed with alkalies, they produce glucosan $C_6H_{10}O_5$, and when hydrolized, glucose $C_6H_{12}O_6$, is formed. Many of the glucosides are bitter principles, and nearly all of them are soluble in alcohol and water; but most of them are insoluble in ether; only a very few of them contain nitrogen.

The subjoined is a list of the more important glucosides :—

Amygdalin.
Æsculin.
Arbutin.
Apiin.
Bryonin.
Cathartic Acid.
Colocynthin.
Cotoin.
Coniferin.
Convolvulin
Crocin.
Daphnin.
Digitalin.
Datiscin.
Elaterin.
Fraxin.
Gentiopicrin.
Glycyrrhizin.
Helleborein.
Helleborin.
Helicin.
Hesperidin.
Indican.
Jalapin.
Laurocerasin.
Myrosin.
Populin.
Phloridin.
Quercitrin.
Salicin.
Scillain.
Saponin.
Senegin.
Syringin

Bitter Principles and Colouring Matters.

Under this class is grouped a number of organic bodies of whose constitution little is at present known. In physical and chemical characters they differ widely, some possessing marked acid properties, whilst others yield metallic compounds with strong bases. This latter character, of some amongst these bodies, undoubtedly depends on the presence of hydroxyl groups situated as in phenols, as some of them can be transformed into phenolic bodies. They also differ widely in their action on the animal economy, some acting as powerful purgatives, others as pure bitter tonics, whilst some are markedly poisonous.

From the fact that they are non-nitrogenous substances, they have frequently been designated neutral principles; the following are those that are best known :—

Bitter Principles.

Aloin.
Antiarin.
Cusparin.
Cascarillin.
Columbin.
Kosin.
Picrotoxin.
Quassiin.
Santonin.

Colouring Matters.

Brazilin.
Carthamin.
Curcumin.
Carotin.
Chlorophyll.
Hæmatoxylin.
Santalin
Erythrolitmin.
Azolitmin.

Resins.

This class of plant constituents, which are widely distributed throughout the vegetable kingdom, are in some instances simple bodies, whilst in others they are very complex substances, consisting of more than one resin. Resins of a simple nature may be either an acid, the anhydride of an acid, or an indifferent body, and they may be readily soluble in alcohol, or in caustic alkaline solutions. The more complex resins are usually soluble in alcohol, ether, or choloroform, and can be more or less saponified with caustic potash. As these bodies are found in plant-tissues more or less mixed with other constituents, they are usually classified under different heads, of which the subjoined are the more important:—

Oleo-Resins.

These generally consist of the solution of a resin or resins in an essential oil. They vary considerably in their appearance, some being fluids of different degrees of viscosity, this character depending upon the amount of the resin present, whilst others are hard amorphous masses, and a few are soft substances. They are all more or less soluble in alcohol or ether, and become more fluid on the application of heat. When submitted to distillation with water they yield the essential oil, the resin proper being left as an amorphous mass. Those which are solid usually melt when heated, and burn with a smoky luminous flame, emitting at the same time a characteristic odour. On the addition of water to their alcoholic solution precipitation of the resin takes place. They are sometimes incorrectly described as *balsams.*

Gum-Resins.

These differ essentially from oleo-resins by consisting of a mixture of resin or resins with varying quantities of gum. They are somewhat hard masses, always amorphous, and when triturated with water yield an emulsion varying in colour. They usually char when heated, and burn with a smoky flame, and sometimes emit acrid fumes. When macerated in alcohol or ether the resin is removed, leaving a more or less coloured residue of gum, which latter frequently differs in its properties from gum acacia. Some gum-resins contain small quantities of essential oil, as is the case with myrrh, &c.

Balsams.

These are combinations of oleo-resins with one or more of the aromatic acids, the acids usually found being benzoic or cinnamic. They are mostly of an aromatic character, having an agreeable fragrant odour and somewhat pungent taste. When ignited they burn with a smoky luminous flame and evolve a fragrant odour. They are, for the most part, soluble in alcohol or ether, or a mixture of the two, the solution being incompatible with water. They are met with of varying degrees of consistency, some being fluid or semifluid, whilst others are hard compact masses, in which case they are known as *balsamic resins.*

Table of Oleo-Resins, &c.

Oleo-Resins.

Copaiba.
Elemi.
Thus.
Turpentine.
Burgundy Pitch.
Canada Balsam.

Gum-Resins containing Volatile Oil.

Asafœtida.
Galbanum.
Myrrh.
Olibanum.
Ammoniacum.
Bdellium.

Gum-Resins.

Scammonium.
Gamboge.
Euphorbium.

Balsams.

Balsam Peru.
Balsam Tolu.
Storax.

Resins.

Dammar.
Guaiacum.
Podophyllin.
Jalap.
Mastich.
Dragon's Blood.
Copal.
Cimicifugin.
Scammony.
Sandarach.
Amber.
Rosin.

Balsamic Resin.

Benzoin.

The Sugars.

These compounds belong to the group called carbohydrates, as they contain either six or some multiple of six carbon atoms, and twice as many hydrogen as oxygen atoms. They are very important compounds, and are widely disseminated throughout the vegetable kingdom. They are divided into three distinct groups, viz. the glucoses $C_6H_{12}O_6$, the saccharoses $C_{12}H_{22}O_{11}$, and the amyloses $C_6H_{10}O_5$, the last being not strictly sugars but starches.

The glucoses, $C_6H_{12}O_6$, are usually regarded as the aldehydes of a hexatomic alcohol $C_6H_8(OH)_6$, but they also behave as pentahydric alcohols $C_5H_6(OH)_5COH$, and some of them are regarded as possessing a closed chain as in benzene compounds, $C_6H_6(OH)_6$. Most of the glucoses are fermentable, a few only differing in that respect; they are also powerful reducing agents, quickly precipitate gold from its solutions, and discharge the colour of indigo sulphuric acid. Many of them possess the power of twisting a ray of polarized light to the right or left, and such are described as dextro or lævogyrate. This optical property of sugar is of great advantage, because by this means it is possible to determine what variety of sugar is present, and also the amount, in any substance.

The Saccharoses.

This class of sugars is closely related to glucose, being regarded as diglucosic alcohols. They differ chiefly from the glucoses in not being directly fermentable, but when treated with yeast they are mostly inverted, prior to conversion into alcohol, carbonic anhydride, and other products. When hydrolized with dilute sulphuric acid, they yield one molecule of glucose and one of lævulose.

Starch. Dextrin and Cellulose.

Starch or Amylum, like sugar, is widely distributed in the vegetable kingdom, but is always in the form of microscopic granules. Starch is regarded as the oxygen ether of glucose, having the formula $C_6H_{10}O_5$, or more correctly, according to Musculus and others, $C_{18}H_{30}O_{15}$. Starch granules vary considerably in size (vide Amylum), form, and in the character of the hilum. Starch is composed of two portions, viz., cellulose and granulose; the former gives a brown colour with iodine, and the latter strikes a deep blue. It is insoluble in cold water, but on boiling swells up, and forms a jelly; when boiled with dilute acids it hydrolizes, and is converted into dextrin.

Inulin

Is the characteristic form of starch found in Compositæ. It is readily soluble in water at a temperature of 58° C. When hydrolized it yields lævulose, and may be determined in this way.

Dextrin

Is a soluble modification of starch, which is found in certain vegetable structures. Closely related to this body is lævulin, sinistrin, and triticin. Dextrin is distinguished from the other three by yielding dextroglucose; they, under similar treatment, yield lævulose.

Cellulose.

This body, which is an isomer of starch, is the fundamental principle of plants, and is distinguished from most other constituents by its resisting the action of chlorate of potash and nitric acid, and chlorine water. The difference in chemical behaviour depends most likely only on the greater or less aggregation of molecules, and also on a more or less admixture of other bodies.

GUM AND PECTIN.

This class of carbo-hydrates consists of combinations of feeble acids, such as arabic, with calcium, potassium, and other bases. They are formed in plants as degradation products, and give rise to two forms of mucilages, soluble and insoluble. Soluble mucilages form with water thick adhesive solutions, from which the gum is precipitated by alcohol. On prolonged boiling with dilute sulphuric acid they yield glucose. The glucoses resulting from different gums differ somewhat in their character, and by this means are distinguished from one another. Nitric acid yields several oxidation products with gums, the principal one being mucic acid.

VOLATILE OILS.

Essential or volatile oils are the proximate principles contained in plants, to which they owe in a great measure their characteristic odour. They are found in all parts of the plants, and very frequently a plant yields more than one volatile oil. On microscopical examination of thin sections of vegetable tissues, numerous cells appear to be filled with nothing but the volatile oil; but in many the volatile oil is contained in what are called receptacles of secretion, or in glands. The presence of such oils in tissues may result from metabolic changes, or from some peculiar phase of fermentation, or from the decomposition of glucosides, resins, or bodies of a similar nature. They possess no chemical, and but very few physical properties in common with the fatty or fixed oils. Their specific gravity usually ranges between ·84 and 1·2. They are generally soluble in alcohol, chloroform, ether, fixed oils, and carbon disulphide. When agitated with water they generally impart their characteristic odour and taste, but are only very slightly soluble in that menstruum. Volatile oils are all more or less inflammable, burning with a bright but somewhat sooty flame.

Elæopten

Is that portion of an essential oil which has the lowest boiling point, and it is very frequently a hydrocarbon of the formula $C_{10}H_{14}$ or $C_{10}H_{16}$.

Stearopten

Is that portion of the oil which distils over last, and which usually solidifies at ordinary temperatures. It may have the formula $C_{10}H_{14}O$, $C_{10}H_{16}O$, or $C_{10}H_{19}OH$. It may frequently be separated from the oil by exposing it to a low temperature, when it crystallizes out, or it may be removed from the oil by agitation with caustic soda solution. These stearoptenes generally possess in a marked degree the odour of the oil, but that from the otto of roses is odourless.

FIXED OILS.

Fixed or fatty oils are found in many plants, but their distribution throughout the plant is much more restricted than that of essential oils. Fatty oils are usually found in seeds, and to a less extent in roots, branches, and leaves. They are compounds of more simple character than the volatile oils, consisting chiefly of ethereal salts of the radical glyceryl. The principal acids found in combination with that base are oleic, palmitic, stearic, and a number of the lower members of the fatty series. Microscopical examination of vegetable tissues soon betrays the presence of fat globules, by their high refractive power, as also by their behaviour with such solvents as petroleum ether, bisulphide of carbon, and solution of sodium hydrate. Fatty oils differ from volatile oils in not distilling when heat is applied; they usually darken in colour, and finally undergo decomposition, at the same time emitting strong offensive odours. When treated with solution of alkaline hydrates they form soaps, from which the fatty acids can be recovered.

Fatty oils are usually classed into two groups, viz., drying and non-drying.

Drying oils are those which on exposure to the air rapidly absorb oxygen, and form a characteristic varnish, such as linseed oil, this change being due to the peculiar modification of oleic acid called linoleic acid. *Non-drying oils*, on the other hand, do not possess the property of rapidly absorbing oxygen, and remain perfectly fluid on exposure to the air.

Determination of Melting Point.

The process for determining the melting point of fats or fatty acids is one of extreme simplicity. Several methods are adopted; the following two are easy of execution, and give fairly concordant results.

No. 1. Place a small piece of the fat on the surface of some mercury contained in a test tube, and introduce the bulb of a thermometer into the mercury. Now place the tube in a beaker of cold water and apply a gentle heat, and note the reading on the thermometer when the fat becomes perfectly clear.

No. 2. Draw some of the melted fat up a capillary tube, and allow one globule of the fat to congeal at the point, place this small tube, previously attached to a thermometer, inside an empty test tube, surround this with cold water, apply a gentle heat, and note the temperature at the moment the globule falls off, this will indicate the melting point.

ALKALOIDS

Are organic bases containing nitrogen; they are regarded as derivatives of ammonia, in which one or more of the atoms of hydrogen are displaced by organic radicals. They resemble ammonia—

Firstly.—By giving off ammonia gas when heated with caustic potash.

Secondly.—By combining with the hydrogen as well as with the acidulous radical of an acid.

Thirdly.—By their containing nitrogen.

Fourthly.—By their hydrochlorates giving precipitates with perchloride of platinum.

No. 234. Eucalypti Gummi. *Eucalyptus Gum.*

N.O.—*Myrtaceæ.*

A ruby-coloured exudation, or so-called red gum, from the bark of Eucalyptus rostrata, and some other species. Imported from Australia.

No. 235. Euonymi Cortex. *Euonymus Bark.*

The dried root bark of Euonymus atropurpureus, *Jacquin.*

Characters.—In quilled or curved pieces, varying in thickness from one-twelfth to one-sixth of an inch. The outer surface is light ash grey in colour, with darker patches, dirty-white where the epidermis has been rubbed off, soft and friable, with occasional rootlets attached. The inner surface, when free from the white wood, is pale tawny white and smooth. The bark breaks transversely with a finely fibrous fracture, the middle layer having a laminated appearance; longitudinally the fracture is smooth. Odour faint but characteristic; taste somewhat mucilaginous and afterwards bitter and slightly acrid.

Official Preparation.—Extractum Euonymi Siccum.

No. 236. Hamamelidis Folia. *Hamamelis Leaves.*

N.O.—*Hamamelaceæ.*

Synonym :—Witch Hazel Leaves.

The dried leaves of Hamamelis virginica, *Linn.*

Characters.—Shortly petiolate, from four to six inches long, oval, obtuse, wavy-crenate, narrowed below, oblique, and slightly heart-shaped at base, pinnately veined, veins prominent on the under surface, nearly smooth. The leaves have a slight tea-like odour and an astringent and bitter taste.

Bark in New B.P.

Official Preparation.—Extractum Hamamelidis Liquidum.

No. 237. Hamamelidis Cortex. *Hamamelis Bark.*

Synonym :—Witch Hazel Bark.

The dried bark of Hamamelis virginica.

Characters.—In quills or slightly curved pieces from two to six or eight inches long and about one-tenth of an inch in thickness, covered with a silvery-gray or whitish easily detached scaly outer bark marked with lenticels. Internally, cinnamon-brown or brownish-red and finely striated longitudinally; transverse fracture coarsely fibrous; tough; taste slightly astringent; no strongly marked odour.

Official Preparation.—Tinctura Hamamelidis.

No. 238. Oleum Cadinum. *Oil of Cade.*

N.O.—*Coniferæ.*

Synonyms:—' Huile de Cade'; Juniper Tar Oil.

An empyreumatic oily liquid obtained by the destructive distillation of the woody portions of Juniperus Oxycedrus, and some other species.

Characters.—A dark reddish-brown or nearly black more or less viscid oily liquid with a not unpleasant empyreumatic odour and an aromatic bitter and acrid taste. Specific gravity about 0·990. It is soluble in ether and chloroform; partially soluble in cold, almost wholly in hot rectified spirit. In water it is very slightly soluble. The filtered aqueous solution is almost colourless and possesses an acid reaction.

No. 239. Strophanthus. *Strophanthus.*

N.O.—*Apocynaceæ.*

The mature ripe seeds of Strophanthus hispidus, freed from the awns.

Characters.—Oval acuminate, about three-fifths of an inch long and one-sixth of an inch broad, the base narrowed but blunt, the apex when present tapering to a fine extremity, flattened at the sides, the dorsal surface being more or less convex; greenish fawn in colour, covered with adpressed silky hairs; one side with a longitudinal ridge running from the centre to the pointed apex. Kernel white and oily, consisting of a straight embryo with two thin cotyledons surrounded by a thin albumen; odour characteristic; taste very bitter. After soaking in water the seed-coat is easily removed.

Official Preparation.—Tinctura Strophanthi.

TABLE OF FRUITS.

Berry or Baccate.
Capsicum fastigiatum.
Myrtus communis.
Pimenta officinalis.
Piper Cubeba.
,, nigrum.
Strychnos Nux-vomica.
,, Ignatii.

Cremocarp.
Carum Ajowan.
,, Carui.
Conium maculatum.
Coriandrum sativum.
Fœniculum capillaceum.
Peucedanum graveolens.
Pimpinella Anisum.

Capsule.
Linum usitatissimum.
Lobelia inflata.
Myristica fragrans.
Ophelia chirata.
Papaver somniferum.
Ruta graveolens.

Drupe.
Cocculus indicus.
Olea Europæa.
Prunus Amygdalus.
,, domestica.
Rhamnus catharticus.

Legume.
Cassia fistula.
Mucuna pruriens.
Tamarindus Indica.
Trigonella Fœnum-græcum.

Hesperidium.
Ægle Marmelos.
Citrus Limonum.
,, vulgaris.

Pepo.
Citrullus colocynthis.
Ecbalium Elaterium.

Siliqua.
Brassica alba.
,, nigra.

Schizocarp.
Croton Tiglium.
Ricinus communis.

Galbalus.
Juniperus communis.
,, Sabina.

Cynarrhodum.
Rosa canina.

Syconus.
Ficus Carica.

Nuculaneum.
Vitis vinifera.

Balausta.
Punica granatum.

Pyxis.
Hyoscyamus niger.

Follicle.
Illicium anisatum.

Sorosis.
Morus nigra.

METHODS OF EXTRACTING THE MOST IMPORTANT B.P. ALKALOIDS; ESTIMATIONS, &c.

ACONITINA.

$C_{33}H_{43}NO_{12}$.

Mix any convenient quantity of aconite root with twice its weight of rectified spirit, and apply heat until ebullition commences; then cool and macerate for four days. Transfer the whole to a displacement apparatus, and percolate, adding more spirit when requisite, until the root is exhausted. Distil off the greater part of the spirit from the tincture, and evaporate the remainder over a water-bath until the whole of the alcohol has been dissipated. Mix the residual extract thoroughly with twice its weight of boiling distilled water (*to dissolve the alkaloid*), and when it has cooled to the temperature of the atmosphere, filter through paper. To the filtered liquid add solution of ammonia in slight excess (*to precipitate the alkaloid*), and heat them gently over a water-bath. Separate the precipitate (*aconitine*) on a filter, and dry it. Reduce this to coarse powder, and macerate it in successive portions of the pure ether with frequent agitation (*to separate impurities*). Decant the several products, mix, and distil off the ether until the extract is dry. Dissolve the dry extract in warm distilled water acidulated with sulphuric acid (*to form sulphate of aconitine*); and, when the solution is cold, precipitate it (*aconitine*) by the cautious addition of solution of ammonia diluted with four times its bulk of distilled water. Wash the precipitate on a filter with a small quantity of cold distilled water (*to remove impurities*), and dry it by slight pressure between folds of filtering paper and subsequent exposure to air.

MORPHINÆ HYDROCHLORAS.

$C_{17}H_{19}NO_3,HCl,3H_2O$.

Macerate 1 pound of opium, sliced, for 24 hours with 2 pints of water, and decant. Macerate the residue for 12 hours with 2 pints of water, decant, and repeat the process with the same quantity of water, subjecting the insoluble residue to strong pressure (*to dissolve out the alkaloids which exist as meconates*). Unite the liquors, evaporate in a water-bath to the bulk of 1 pint, and strain through calico. Pour in now ¾ ounce of chloride of calcium previously dissolved in 4 fluid ounces of distilled water, and evaporate until the solution is so far concentrated that upon cooling it becomes solid. (*The meconate of morphine on the addition of chloride of calcium forms insoluble meconate of calcium and soluble hydrochlorate of morphine.*) Envelop the mass in a double fold of strong calico, and subject it to powerful pressure, preserving the dark fluid which exudes. Triturate the squeezed cake with about half a pint of boiling distilled water, and, the whole being thrown upon a paper filter, wash the residue well with boiling distilled water. The filtered fluids having been evaporated as before, cooled, and solidified, again subject the mass to pressure; and, if it be still much coloured, repeat this process a third time, the expressed liquids being always preserved. Dissolve the pressed cake in 6 fluid ounces of boiling distilled water; add ¼ ounce of animal charcoal, and digest for 20 minutes; filter, wash the filter and charcoal with boiling distilled water, and to the solution thus obtained add solution of ammonia in slight excess (*to reprecipitate the alkaloid morphine*). Let the pure crystalline morphine which separates as the liquid cools be collected on a paper filter, and washed with cold distilled water until the washings cease to give a precipitate with solution of nitrate of silver acidulated by nitric acid (*indicatiug absence of chloride of ammonium*).

From the dark liquids expressed in the above process an additional product may be obtained by diluting them with distilled water, precipitating with solution of potash added in considerable excess, filtering, and supersaturating the filtrate with hydrochloric acid. This acid liquid digested with a little animal charcoal, and again filtered, gives upon the addition of ammonia a small quantity of pure morphine.

Diffuse the pure morphine, obtained as above, through 2 fluid ounces of boiling distilled water placed in a porcelain capsule kept hot, and add, constantly stirring, 2 fluid ounces or a sufficiency of diluted hydrochloric acid, proceeding with caution, so that the morphine may be entirely dissolved and a neutral solution be obtained.

MORPHINÆ ACETAS.

$C_{17}H_{19}NO_3,HC_2H_3O_2,3H_2O.$

Dissolve 2 ounces of hydrochlorate of morphine in 1 pint of distilled water, and add solution of ammonia until the morphine is precipitated and the liquid rendered slightly alkaline. Collect the precipitate on a filter, wash it with distilled water, then having transferred it to a porcelain dish, add 4 ounces of distilled water and a sufficient quantity of acetic acid to neutralize and dissolve it. Evaporate the solution by the heat of a water-bath, maintaining acetic acid in slight excess, until it concretes on cooling. Lastly, dry the salt with slight heat, so as to avoid much loss of acetic acid, and reduce it to powder. Keep the product in a well-stoppered bottle.

STRYCHNINA.

$C_{21}H_{22}N_2O_2.$

Heat 1 pound of split nux vomica seeds to a temperature of 212° F. (100° C.) for 3 hours, and then reduce to a fine powder. Digest the powder for 12 hours with 2 pints of rectified spirit and 1 of water, gently heating (*to exhaust the seeds*) ; strain through linen, express strongly and repeat the process twice. Distil off the spirit from the mixed fluid, evaporate the watery residue to about 16 ounces, and filter when cold. Add now 180 grains of acetate of lead, previously dissolved in distilled water, so long as it occasions any precipitate (*to precipitate the igasuric acid and colouring matter*); filter; wash the precipitate with 10 ounces of cold water, adding the washings to the filtrate; evaporate the clear fluid (*acetate of strychnine and brucine*) to 8 ounces, and when it has cooled add solution of ammonia in slight excess, stirring thoroughly (*to precipitate the alkaloids strychnine and brucine*). Let the mixture stand at the ordinary temperature for 12 hours; collect the precipitate on a filter, wash it once with a few ounces of cold distilled water, dry it in a water-bath or hot-air chamber, and boil it with successive portions of rectified spirit (*to dissolve the alkaloids*) till the fluid scarcely tastes bitter. Distil off most of the spirit, evaporate the residue to the bulk of about half an ounce, and set it aside to cool. Cautiously pour off the yellowish mother liquor (*which contains the brucine*) from the white crust of strychnine which adheres to the vessel. Throw the crust on a paper filter, wash it with a mixture of 2 parts of rectified spirit and 1 of water, till the washings cease to become red on the addition of nitric acid (*indicating absence of brucine*); finally, dissolve it (*the strychnine*) by boiling with an ounce of rectified spirit, and set it aside to crystallize. More crystals may be obtained by evaporating the mother liquor.

QUININÆ SULPHAS.

$$\{(C_{20}H_{24}N_2O_2)_2H_2SO_4)\}_2 15H_2O.$$

The sulphate of an alkaloid prepared from the powder of various kinds of Cinchona and Remijia by extraction with spirit after the addition of lime, or by the action of alkali on an acidulated aqueous infusion, with subsequent neutralization of the alkaloid by sulphuric acid and purification of the resulting salt.

QUININÆ HYDROCHLORAS.

$C_{20}H_{24}N_2O_2HCl,2H_2O$.

Obtained from the same sources and by the same process as sulphate of quinine, the separated alkaloid being neutralized by hydrochloric acid.

ESTIMATION OF OPIUM.

Triturate together 140 grains of powdered opium dried at 212° F., and 60 grains of freshly slaked lime, and 400 grain-measures of distilled water in a mortar until a uniform mixture results; then add 1000 grain-measures of distilled water and stir occasionally during half an hour. Filter the mixture through a plaited filter about 3 inches in diameter into a wide-mouthed bottle or stoppered flask (having the capacity of about six fluid ounces and marked at exactly 1040 grain measures) until the filtrate reaches this mark. To the filtered liquid (representing 100 grains of opium) add 110 grain-measures of rectified spirit and 500 grain-measures of ether, and shake the mixture; then add 40 grains of chloride of ammonium, shake well and frequently during half an hour, and set it aside for 12 hours. Counterbalance two small filters; place one within the other in a small funnel, and decant the ethereal layer as completely as practicable upon the inner filter. Add 200 grain-measures of ether to the contents of the bottle and rotate it; again decant the ethereal layer upon the filter, and afterwards wash the latter with 100 grain-measures of ether added slowly and in portions. Now let the filter dry in the air, and pour upon it the liquid in the bottle in portions, in such a way as to transfer the greater portion of the crystals to the filter. When the fluid has passed through the filter, wash the bottle and transfer the remaining crystals to the filter, with several small portions of distilled water, using not much more than 200 grain-measures in all, and distributing the portions evenly upon the filter. Allow the filter to drain, and dry it, first by pressing between sheets of bibulous paper, and afterwards at a temperature between 131° and 140° F. (55° and 60° C.), and, finally, at 194° to 212° F. (96° to 100° C.). Weigh the crystals in the inner filter, counterbalancing by the outer filter. The crystals should weigh ten grains, or not less than nine and a half and no more than ten and a half grains, corresponding to about ten per cent. of morphine in the dry powdered opium.

Reactions.

The morphine exists in the Opium in combination with meconic acid. When the lime and water are added the morphine is set free, and the meconic acid combines with the lime, forming meconate of calcium. Morphine is not soluble to an appreciable extent in pure water, but is freely soluble in the lime water formed from the excess of lime used, it therefore passes through in the filtrate, and the insoluble meconate of calcium remains behind. The solution also contains narcotine and codeine. On adding the alcohol and ether the narcotine is taken up by the ethereal layer as it is much more soluble in this than in water. The chloride of ammonium is now added, this reacts with the calcic hydrate, forming chloride of calcium and free ammonia. Morphine is not soluble in ammonia and is therefore precipitated. The ethereal layer is first decanted on a filter, when it passes through, carrying with it the narcotine, which is then rejected. The ammoniacal liquid containing the crystals of morphine is now transferred to the filter, when the crystals of morphine are retained, washed, dried, and weighed. The ammoniacal liquid which passes through contains the codeine, which, unlike morphine, is soluble in excess of ammonia.

ESTIMATION OF CINCHONA.

Rub together in a mortar 200 grains of powdered red cinchona bark and 60 grains of hydrate of calcium, and make them into a paste with half-an-ounce of water, and allow it to stand for two hours.

Boil the paste with three ounces of benzolated amylic alcohol for half-an-hour, pour off the alcohol on to a filter and repeat the boiling a second and third time, then put the contents of the flask on to a filter and wash with more alcohol.

Put the filtrate and washings into a separator, and add to it twenty minims of dilute HCl mixed with two drachms of water, shake well, and draw off the acid solution, repeat this twice with distilled water slightly acidulated with HCl.

Carefully neutralize the acid solution with solution of ammonia, and concentrate to three drachms.

To this add fifteen grains of tartarated soda dissolved in half a drachm of water, and stir with a glass rod; tartrates of quinine and cinchonidine will completely separate in about an hour; collect these on a double or tared filter, wash, dry and weigh. Eight-tenths of the weight will be quinine and cinchonidine; divide by two to get percentage.

To the mother liquor add slight excess of ammonia, the remainder of the alkaloids will be precipitated; collect, wash, dry and weigh—divide the weight by two to get percentage—add both percentages together—the result is percentage of total alkaloids.

Reactions.

1. The lime sets the alkaloids free.
2. The benzolated amylic alcohol dissolves them out.
3. The hydrochloric acid removes them from the alcohol, as hydrochlorates.
4. The ammonia neutralizes any free acid.
5. The tartarated soda precipitates the quinine and cinchonidine as insoluble tartrates.
6. The ammonia precipitates the remainder of the alkaloids.

ESTIMATION OF NUX VOMICA.

Dissolve ten grains of the extract in half a fluid ounce of water; heat gently if necessary.

Dissolve half-a-drachm of Na_2CO_3 in half-an-ounce of water, and add it to the liquid, then add half a fluid ounce of chloroform, agitate, warm gently and draw off the chloroform.

To the chloroform solution add half-an-ounce of dilute H_2SO_4 mixed with half-an-ounce of water, again agitate, warm, and separate the acid liquor from the chloroform.

To the acid liquor add excess of solution of ammonia, and agitate with half-an-ounce of chloroform.

Draw off the chloroform, transfer it to a weighed dish and evaporate the chloroform on a water bath.

Dry the residue for an hour and weigh; there should be one grain and a half of total alkaloids.

Reactions.

1. The Na_2CO_3 sets the alkaloids free.
2. The chloroform removes the alkaloids with fatty matter.
3. The H_2SO_4 converts the alkaloids into sulphates.
4. NH_4HO precipitates them.
5. The chloroform dissolves them.
6. The evaporation leaves the alkaloids in the dish.

TABLES OF PERCENTAGES.

FIXED OILS.	AVERAGE PERCENT.
Almond, Bitter	45—40
,, Sweet	56
Castor Oil Seeds	40—60
Coriander	14
Croton Seeds	50
Henbane Seeds	25
Fennel	13
Linseed	25—40
Mustard Seeds	25
Nutmeg	28
Star Anisi	25
Stramonium Seeds	25
Theobroma Seeds	38—52

RESINS.	AVERAGE PERCENT.
Ammoniacum	65—72
Asafœtida	45—65
Galbanum	50—60
Gamboge	78
Guaiacum Wood	20—25
Jalap	12—18
Kamala	80
Olibanum	57—75
Podophyllum Rhizome	3·5-5
Scammony Root	5
Scammony	50—95
Sumbul Root	9

VOLATILE OILS.	AVERAGE PERCENT.
Ajowan	6
Ammoniacum	2·8
Anisi Fruit	2
Asafœtida	5—9
Caraway	8
Cardamoms	5
Chian Turpentine	15
Chamomile Flowers	5
Cloves	14—20
Coriander	1
Dill	4
Elder Flowers	·5
Fennel	4
Galbanum	8
Lavender	1
Nutmeg	8
Olibanum	4—7
Savin Tops	2·5
,, Fruits	10
Spearmint	·5
Star Anise	4—5
Valerian Rhizome	·5—2
Wormseed	2

GUM.	AVERAGE PER CENT.
Ammoniacum	24
Asafœtida	30
Galbanum	20

TABLES OF PERCENTAGES.

ALKALOIDS.		AVERAGE PER CENT.
Aconite Root	Aconitine	·03
Belladonna Root	Atropine	·25—·6
Cinchona, Red	Total Alkaloids	5—9
Guarana	Caffeine	3·2—5
Nux Vomica Seeds	Strychnine and Brucine	2—5
Opium	Codeine	·4—·5
,,	Morphine	10—15
,,	Narcotine	1·3—11
,,	Narceine	·02—·71
,,	Thebaine	·15
St. Ignatius Beans	Strychnine	1·5
Theobroma Seeds	Theobromine	1·2—4·8

ACTIVE PRINCIPLES, &c.		AVERAGE PER CENT.
Balsam Peru	Cinnamein	60
Barbadoes Aloes	Barbaloin	10—20
Colocynth Pulp	Colocynthin	·25
Elaterium	Elaterin	20—30
Indigo	Indigotin	50—70
Manna	Mannite	55—85
Wormseed	Santonin	2

TANNIN, &c.		AVERAGE PER CENT.
Bearberry Leaves	Tannic Acid	35
Bistort	,, ,,	21
Catechu, Black	Catechu-tannic Acid	22—50
Catechu	,, ,,	26—38
Cherry Bark, Wild	A Tannin	4
Cinchona Barks	Cincho-tannic Acid	2—4
Galls	Gallo-tannic Acid	70
,,	Gallic Acid	3
Rhatany Root	Rhatania-tannic Acid	17—20
Tormentil	Tormentil-tannic Acid	20—25

ACIDS.		AVERAGE PER CENT.
Balsam Peru	Cinnamic & Benzoic Acids	8
Benzoin	Benzoic Acid	21

ANIMAL MATERIA MEDICA.

The animal kingdom is divided into two sub-kingdoms:—

(1) *Invertebrata.*—Having no back bone.

(2) *Vertebrata.*—Having a spinal bone, protecting the spinal chord.

Invertebrata.

Sponge.
Leech.
Spanish Fly.
Cochineal.
Hive Bee.

Vertebrata.

Sturgeon.
Cod.
Domestic Fowl.
Sperm Whale.
Musk Deer.
Sheep.
Pig.
Calf.
Ox.

INVERTEBRATA.

17

Class: PORIFERA.

(*Having numerous pores or openings.*)

Spongia. *Sponge.*

The dry skeleton of Spongia officinalis, and other species.

Collection.—The inhabitants of the Greek Islands collect sponge by diving for it. In their submarine operations the divers carry with them a knife, with which they detach the sponge, which adheres to the rocks by a very broad base.

It often contains stony or earthy concretions, and shells. As soon as it is brought on shore, it is squeezed and washed to get rid of the gelatinous matters which it contains; or otherwise putrefaction speedily ensues.

Spongia Usta. *Burnt Sponge.*

Preparation.—Cut the sponge into pieces, beat it to free it from sand and stones; burn it in a closed iron vessel until it becomes black and friable, and reduce it to powder.

Hirudo. *The Leech.*

No IV

(1) Sanguisuga medicinalis, the Speckled Leech.

(2) S. officinalis, the Green Leech. Collected in Spain, France, Italy, and Hungary.

Collection.—Leeches may be caught with the hand, or by a net, or by the gatherers going into the ponds with naked feet, to which the leeches adhere; or by baits, especially the liver of animals.

Characters.—Body elongated, two or three inches long, tapering to each end; plano-convex, wrinkled transversely; back olive-green with six rusty-red longitudinal stripes. S. medicinalis, belly greenish-yellow, spotted with black. S. officinalis, belly olive-green, not spotted.

CLASS: INSECTA.

No I

ORDER: COLEOPTERA. *The Beetle Order.*

Cantharis Vesicatoria. *The Blister Beetle, or Spanish Fly.*

The Beetle, dried; collected chiefly in Hungary.

Mode of catching and drying Cantharides.—In the south of France these animals are caught during the month of May, either in the morning or evening, by spreading cloths under the trees, which are then shaken, or beaten with poles. The catchers usually cover their faces, and guard their hands by gloves. The Insects are killed by exposing them to the vapour of vinegar, hot water, spirit of wine, or oil of turpentine, but they are more frequently destroyed by immersing the cloths containing them in hot vinegar and water, and then drying them as rapidly as possible in the sun, on hurdles covered with paper or cloths, or by other means of an analogous nature.

Characters.—From eight to ten lines long, furnished with two wing covers of a shining metallic-green colour, under which are two membranous, transparent wings; odour strong and disagreeable; powder greyish-brown, containing shining green particles. Free from mites.

They should be preserved in well-stoppered bottles, and to prevent them from being attacked by mites, a few drops of strong acetic acid should be added. Camphor and alcohol are employed for the same purpose.

Composition.—The principal constituents of cantharides are, *cantharidin*, a *volatile odorous oil*, and *fatty matter*. Cantharidin constitutes about 0·4 per cent. of the cantharides.

Mylabris Cichorii. *Chinese Blistering Fly.*

This belongs to the same order and class as Cantharis Vesicatoria.

CLASS: INSECTA.

ORDER: HEMIPTERA. *Wingless.*

Coccus Cacti. *Cochineal Insect.*

2

The dried female insect, reared in Mexico and Teneriffe.

The insects feed on the *Nopal plant* (*Opuntia cochinillifera*). They are domesticated and reared with the greatest care; plantations of the Nopal being cultivated for their nourishment. Here the impregnated females are placed; this operation being denominated *sowing*. Young ones are soon developed; and some months afterwards, when the females have become fecundated and enlarged, the harvest commences. The insects are brushed off, and killed by immersing them in hot water, and afterwards drying them in the sun, or by the heat of a stove.

Before the rainy season commences, branches of the Nopal plant, loaded with infant insects, are cut off and preserved in the houses of the Mexicans, to prevent the insects being destroyed by the weather.

Silver cochineal is said to be the matured and fecundated female; black cochineal the female exhausted by propagation; the former kind is the better.

Composition.—The principal constituent is *cochenillin.*

Coccus Lacca

Is a poisonous colouring substance produced by the insect Coccus lacca, which inhabits certain trees; among others on the Indian fig-tree, the Pagoda fig-tree, the Jujube tree, on the Croton, etc.

These last-mentioned insects produce a colouring matter known under the name of Lac Dye. They fix themselves on the little branches, getting together in great numbers, forming nearly straight lines. The bodies of many fecundated females, united together by a resinous exudation which is caused by the piercing of the bark, constitutes the matter called in commerce and by dyers by the name of Lac Dye, Shell-lac, Gum-lac, etc.

Resinous lac is found in commerce under four forms: First, the stick-lac, such as is found concentrated at the extremity of the branches whence it exudes—it is an irregular brownish crust; secondly, the seed-lac, picked off the branches and pounded; thirdly, shell-lac, in scales melted down and run into thin plates, which vary in quality according to the proportion of colouring matter they contain; fourthly, thread-lac, which resembles reddish threads, and is prepared thus in India.

CLASS: INSECTA.

ORDER: HYMENOPTERA.

Apis Mellifica. *The Hive Bee.*

Mel. *Honey.*

A saccharine secretion deposited in the honeycomb, by Apis mellifica, *Linn.*, the hive bee.

Production.—Honey is secreted by flowers, and is collected by the working or neuter bees, who take it by suction or lapping, and pass it into the dilatation of the œsophagus, denominated the *crop*, *sucking-stomach*, or *honey-bag;* beyond which the honey probably does not pass, as it has never been found in the true stomach. While retained in the honey-bag it receives the addition of an acid which possesses all the reactions of formic acid. On arriving at the hive, the honey is disgorged by a kind of inverted peristaltic motion into the comb, where it remains till the stock is taken. It is used by the insects as food.

Characters.—When freshly collected, honey is a viscid semi-translucent liquid, of a yellowish colour, with a peculiar heavy odour, and a very sweet taste. It does not become blue with the solution of iodine. By keeping, it becomes thicker, somewhat opaque, and of a brownish-yellow colour. The flavour of Narbonne honey, which is so much admired, is said to arise from the labiate flowers on which the insects feed. To imitate this a sprig of rosemary is sometimes added to the honey obtained from other places.

3 Cera Flava. *Yellow Wax.*

Yellow wax is prepared from the honeycomb of the Hive Bee, Apis mellifica.

It is secreted in glands placed on the ventral scales of the bee, with this wax the bees construct the comb. The substance called propolis is collected by the bees from the buds of trees. It is of a resinous nature, and is used for lining the cells of a new comb, stopping crevices, etc.

The comb, from which the honey has been allowed to drip, is first subjected to pressure. It is then melted in water, by which means the impurities subside, and the wax is poured into moulds and left to cool.

It is sometimes adulterated with suet, which gives it a fatty and disagreeable taste. Resin is frequently added to it, and may be detected by its solubility in cold alcohol; bean and pea meal, which are sometimes used as adulterants, may be detected by their insolubility in oil of turpentine.

Characters and Tests.—Firm, breaking with a granular fracture, yellowish, having an agreeable, honey-like odour. Not unctuous to the touch. Should be readily and entirely soluble in hot oil of turpentine. Should not yield more than three per cent. to cold rectified spirit, and nothing to water (*absence of soap*) or to a boiling solution of soda (*absence of fats or fatty acids*), the two latter fluids after filtration not being turbid nor yielding a precipitate on the addition of hydrochloric acid. Specific gravity ·950 to ·970. Melts at 146° F. when tested in the following manner. Liquefy a few grains, and draw a little of the fluid up into a capillary tube; fix a piece of the filled capillary tube to the bulb of a thermometer by thread; immerse the bulb and tube in a beaker of water and heat the latter gently; at the moment the opaque rod of wax becomes transparent, note the temperature. The solidifying point is two to three degrees lower than the melting point. Boiling water in which it has been agitated is not, when cooled, rendered blue by iodine.

Cera Alba. *White Wax.*

This is yellow wax bleached by exposure to moisture, air, and light.

The bleaching is effected by melting yellow wax by means of steam, running it off while in the melted state into a trough called a cradle, perforated at the bottom with holes, and placed over a large water tank, at the end of which is a revolving cylinder almost wholly immersed in water. By this means the wax is solidified, converted into a kind of ribbon, and conveyed on the surface of the water to the other end of the tank. These ribbons of wax are here lifted out, and carried in baskets to the bleaching grounds, where they are exposed to the air for one or two weeks, being turned every day, and watered from time to time. The wax is then re-melted, re-ribboned, and re-bleached. It is subsequently refined by melting in water acidulated with sulphuric acid.

Spermaceti is frequently added to the circular cakes of commerce to improve the colour.

It should respond to the tests given under yellow wax.

11

~~VERTEBRATA~~. Sturiones

Class : PISCES. *Fishes.*

Acipenser. *Isinglass.*

The swimming bladder of various species of Acipenser, prepared and cut into fine shreds.

Preparation.—The organ from which isinglass is usually procured is the *air-bag* or *swimming bladder*. It is a membranous sac filled with air, and placed under the spine, in the middle of the back, and above the centre of gravity. The mode of preparing the swimming bladder for sale as isinglass varies in different countries. Sometimes the bag is dried unopened, as in the case of the *purse*, *pipe*, and *lump* isinglass of the shops. At other times it is laid open, and submitted to some preparation, being either dried unfolded, as in the *leaf* and *honeycomb* isinglass; or folded as in the *staple* and *book* isinglass; or rolled out, as in the *ribbon* isinglass. When the isinglass arrives in this country, it is soaked, scraped, and cleaned. Formerly it was picked into shreds by women and children, but it is now usually rolled and cut into filaments by machinery.

Solution of gelatine is used as a test to distinguish gallic from tannic acid; tannic acid gives with it a yellowish-white precipitate; gallic acid has no effect.

9

Gadus Morrhua. *The Cod.* NO. Teleostei.

Oleum Morrhuæ. *Cod-Liver Oil.*

The oil extracted from the fresh liver of the cod, Gadus Morrhua, by the application of a heat not exceeding 180°.

Preparation.—In Newfoundland the best oil is obtained by placing the fresh and cleaned livers, in a comminuted state, directly they are taken from the fish, in a boiler, and heating them, at as low a temperature as is required, by the application of steam heat. By this means the liquid oil separates and floats at the surface, from which it is ladled and filtered into casks, with as little exposure to the air as possible. If much solid fat separates from this by cooling, it is again strained and is ready for use.

Pale Oil. Best.
[illegible] Brown Oil Inferior Quality.
[illegible] Very do do

Sharks liver oils — an adulterant
Seals " " — do

Characters.—Pale yellow, with a slight fishy odour, and bland fishy taste. A drop of sulphuric acid added to a few drops of the oil on a porcelain slab develops a violet colour, which soon passes to a yellowish or brownish-red.

Composition.—Oleine 80 per cent., *margarine* about 15 per cent., with a substance called *gaduin* analogous to one of the bile acids, *cholic, acetic,* and *butyric acids.*

CLASS: AVES. *Birds.*

ORDER: GALLINÆ.

Gallus Bankiva. *The Domestic Fowl.*

Ovi Vitellus. *Yolk of Egg.*

The yolk of the egg of Gallus Bankiva, var. domesticus. This is used in the preparation of Mistura Spiritus Vini Gallici.

Ovi Albumen. *Egg Albumen.*

The liquid white of the egg of Gallus Bankiva.

It contains about 12 per cent. of albumen; the yolk contains 3 per cent.

Albumen is a nitrogenous substance, found to a large extent in the white of egg, and to a smaller extent in the yolk of the egg. Albumen, which at ordinary temperatures is a clear fluid, when heated forms an opaque solid known as coagulated albumen. This coagulated albumen is of the same composition as ordinary albumen, but is an isomeric modification of it; the change in properties being due to the atoms being differently arranged in the molecule.

Albumen is useful as an antidote in cases of poisoning by many metallic salts, such as corrosive sublimate, sulphate of copper, and sugar of lead, as it forms an insoluble compound with these salts.

CLASS: MAMMALIA. *Animals which suckle their young.*

ORDER: CETACEA. *Pertaining to whales.*

13

Physeter Macrocephalus. *The Sperm Whale.*

Cetaceum. *Spermaceti.*

A concrete fatty substance, obtained, mixed with oil, from the head of the sperm whale, Physeter Macrocephalus.

Preparation.—The semifluid substance is removed from the head of the whale, it is then drained in suitable bags and afterwards submitted to strong pressure to remove the oil; the pressed cake is now melted in warm water and any impurities removed, then boiled with a weak caustic soda solution and then washed with warm water; it is finally allowed to solidify in suitable vessels.

Characters and Tests.—Spermaceti is a pearly white translucent and crystalline substance, unctuous to the touch, having a mild bland taste, and a faint fatty odour; when melted it is perfectly neutral to litmus paper. It is readily reduced to powder when previously moistened with rectified spirit. It is soluble in ether, carbon bisulphide, chloroform, and boiling alcohol. Melting point 111° to 122° F.; Sp. gr. ·943 to ·945.

Impurities.—When Spermaceti becomes yellow and rancid it is due to imperfect removal of the oil. It should dissolve in 40 times its weight of boiling alcohol (*absence of fats*), and when cold the solution should not be acid in reaction (*absence of fatty acids*).

Used in the preparation of Charta Epispastica and Unguentum Cetacei.

ORDER: RUMINANTIA. *Animals which chew the cud.*

6

Moschus Moschiferus. *The Musk Deer.*

Moschus. *Musk.*

The dried secretion from the preputial follicles of Moschus moschiferus.

Habitat.—Thibet and Central Asia. Imported from China and India.

The follicles are lined by a smooth membrane, which secretes the musk. There are *two* varieties—*Chinese* and *Russian.* The Chinese sacs are the smaller, and the colour of the hairs darker than the Russian.

From 100 to 200 grains of musk are contained in each sac. The sac containing the musk is often emptied of its contents, and filled up with a mixture of dried blood and a little true musk, and the sac carefully closed up again. Traces of the opening should be looked for.

Sometimes the sacs are made from the skin of the animal and filled with a mixture of dried blood, sand, and musk.

ORDER: RUMINANTIA.

Ovis Aries. *The Sheep.* (5)

Sevum Præparatum. *Prepared Suet.*

The internal fat of the abdomen of the sheep, Ovis Aries, purified by melting and straining.

Characters.—Mutton suet is the fat from the neighbourhood of the kidneys of the animals. It is prepared by melting it over a slow fire, and straining through linen or flannel in order to separate the membranous portions.

Composition.—Suet is principally composed of *stearine* and *oleine*, with a little *margarine.*

Used in the preparation of ointment of mercury and cantharides plaster.

Adeps Lanæ. *Wool Fat.*

The purified cholesterin-fat of sheep's wool.

Characters and Tests.—A yellowish tenacious unctuous substance; almost inodorous; with a melting-point varying from 100° F. to 112° F.; readily soluble in ether and in chloroform, sparingly soluble in rectified spirit. Ten grains should dissolve almost completely in fourteen fluid drachms of boiling ethylic alcohol, the greater part separating in flocks on cooling. Ignited with free access of air, it burns, leaving but a trace of ash. Fifty grains dissolved in four fluid drachms of ether, and two drops of tincture of phenolphthaleïn added, should not require more than two grain-measures of volumetric solution of soda to produce a permanent red coloration. The solution in chloroform poured gently over the surface of sulphuric acid acquires a purple-red colour. Heated with solution of soda, no ammoniacal odour should be evolved.

Cholesterin, Palmatin & Olein.

Adeps Lanæ Hydrosus. *Hydrous Wool Fat.*

Wool Fat	7 ounces.
Distilled Water	3 ounces.

Melt the wool fat in a warm mortar, stirring in the water gradually and thoroughly.

Characters and Tests.—Yellowish white, free from rancid odour. When heated it separates into an upper oily and lower aqueous layer. One hundred grains exposed over a water-bath until the weight is constant yields not less than seventy grains, which should answer to the tests for wool fat.

Used in the preparation of Unguentum Conii.

8

ORDER: RUMINANTIA.

Bos Taurus. *The Ox.*

Lac. *Milk.*

The fresh milk of the cow, Bos Taurus.

Milk is an opaque white fluid, with a faintly alkaline reaction, bland and sweet taste, and peculiar odour. Specific gravity (about) 1·030. Examined under the microscope it is seen to be a clear transparent fluid, with numerous minute fat globules floating in the liquid.

Composition.—The following represents the average composition of cows' milk.

Water	88·0
Fat...	3·0
Albumenoids	3·5
Sugar	5·0
Kaseine = Salts	·5
	100·0

Sour milk is due to the decomposition of Lactose

Milk possesses remarkable emulsifying properties.

Used in the preparation of Mistura Scammonii.

Saccharum Lactis. *Sugar of Milk.*

Synonym:—Lactose ($C_{12}H_{24}O_{12}$).

This substance gives the sweet taste to fresh milk. It is procured by evaporating the whey of fresh milk, after the separation of the casein and oil. It is usually met with in large crystalline masses 2 inches in diameter, with a cord or stick in the axis. It is prepared in Switzerland from whey, in the manufacture of Gruyere cheese. It is white, hard, and gritty, and only slightly sweet to the taste, soluble in about 7 parts of water at common temperatures, and 1 part of boiling water. It does not form a syrup. It is insoluble in alcohol and ether. Its aqueous solution turns a ray of polarized light to the right. Dilute acids convert it into glucose. Nitric acid converts it into oxalic and mucic acid. Lactose differs from other sugars, and resembles gums, in producing mucic acid with nitric acid.

Used in the preparation of Pulvis Elaterini Compositus.

10 **Fel Bovinum Purificatum.** *Purified Ox Bile.*

The purified gall of the Ox, Bos Taurus.

Mix one pint of fresh Ox Bile with two pints of rectified spirit by agitation in a bottle, and set aside for twelve hours until the sediment subsides. Decant the clear solution, and evaporate it in a porcelain dish by the heat of a water-bath, until it acquires a suitable consistence for forming pills.

Characters.—A yellowish-green substance, having a taste partly sweet, and partly bitter, soluble in water and in spirit. A solution of one or two grains of it, in about a fluid drachm of water, when treated, first with a drop of freshly-made syrup consisting of one part of sugar and four of water, and then with sulphuric acid cautiously added until the precipitate at first formed is redissolved, gradually acquires a cherry-red colour, which changes in succession to carmine, purple, and violet. Its watery solution gives no precipitate on the addition of rectified spirit.

ORDER: PACHYDERMATA. *Thick-skinned Animals.*

14

Sus Scrofa. *The Hog.*

Adeps Præparatus. *Prepared Lard.*

Synonyms :—Axungia, Adeps Suillæ.

The purified internal fat of the abdomen of the hog, Sus scrofa.

It contains about 62 per cent. of oleine and 38 per cent. of stearine. The fat should be freely exposed to the air to deprive it of its colour, then cut into small pieces and beaten in a mortar to break up the membranous vesicles; it should then be placed in a vessel surrounded by warm water, and a temperature not exceeding 130° F. applied, until the fat has melted and separated from the membranous matter. Finally, the melted fat should be strained through flannel.

Lard is a soft, white, fatty substance, melting at about 100° F. It should have no rancid odour, and should dissolve entirely in ether.

The water in which it has been boiled, and cooled, should give no precipitate with nitrate of silver, *indicating absence of chlorides (chloride of sodium).*

It frequently contains water, the amount of which may be estimated by heating a known weight on a sand bath, then cooling and weighing; the loss corresponds to the quantity of water present.

Lard is apt to go rancid on keeping, and becomes mouldy if it contains water: this is due to the oleine which becomes rancid, the stearine does not.

If subjected to great pressure the greater portion of the oleine is separated, and stearine remains.

Adeps Benzoatus. *Benzoated Lard.*

Prepared by digesting 140 grains of benzoin in coarse powder, in 1 pound of prepared lard, by the heat of a water-bath for 2 hours, and straining.

This corresponds to 1 part of benzoin to 50 parts of lard.

The preserving properties of benzoin in benzoated lard is

Pepsin Pancreatin
or unorganized Ferments.

supposed by some to be due to the volatile oil it contains, but this can hardly be so, since the oil is dissipated by the heat; it is most probably due to traces of the resin, which is extracted by the fat along with the whole of the acid.

Pepsin. *Pepsin.*

A preparation of the mucous lining of the fresh and healthy stomach of the pig, sheep, or calf. It may be prepared as follows:—

The stomach of one of these animals recently killed having been cut open and laid on a board with the inner surface upwards, any adhering portions of food, dirt, or other impurity, are to be removed and the exposed surface slightly and rapidly washed with a little cold water; the cleansed mucous membrane is then to be scraped with a blunt knife or other suitable instrument, with some pressure, and the viscid pulp thus obtained is to be immediately spread over the surface of glass or glazed earthenware and quickly dried at a temperature not exceeding 100° F. The dried residue is to be reduced to powder and preserved in a stoppered bottle.

It is a light yellowish-brown powder, having a faint but not disagreeable odour, and a slightly saline taste, without any indication of putrescence. Very slightly soluble in water or spirit. 2 grains of it with an ounce of distilled water, to which 5 minims of hydrochloric acid have been added, form a mixture in which at least 100 grains of hard-boiled white of egg, passed through wire gauze of 36 meshes per linear inch, and made of No. 32 brass or copper wire, will dissolve on their being well mixed, digested, and well stirred together for 30 minutes at a temperature of 130° F.

Dose.—2 to 5 grains.

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ORDER: RODENTIA.

12

Castor Fiber. *The Beaver.*

Castoreum. *Castor.*

The dried preputial follicles and their secretion, obtained from the Beaver, Castor Fiber, and separated from the some-

Pancreas only acts in Alkaline Medium

what shorter and smaller oil sacs which are frequently attached to them.

Habitat.—Hudson's Bay Territory.

Characters.—Follicles in pairs, about three inches long, fig-shaped, firm, and heavy, brown or greyish-black ; containing a dry resinous reddish-brown or brown highly odorous secretion, in great part soluble in rectified spirit, and in ether.

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